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OUR
UNTITLED NOBILITY

BY

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AUTHOR OF
"LIVES OF EMINENT MEN," "BIBLE STORIES," "TALES
ABOUT ANIMALS," ETC.

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PREFACE.

NOBILITY, in its comprehensive sense, refers to a larger and wider class than that to which the term is usually applied. Like the word gentleman, it properly signifies a state of mind and heart rather than of condition; money cannot buy it, kings cannot confer it, birth cannot ensure it: true Nobility, a man must win for himself.

This self-won true nobility is found among all classes: it lifts its branches high, and buries its roots deep; there are rich and poor, known and unknown, titled and untitled, of this distinguished order.

How many names shine out on the pages of this peerage, brighter than the jewels of the coronet, by good deeds done; how many brave

men and women have worked their way into the illustrious roll, and without being “born great,” have “achieved greatness.” Let us breathe no whisper of disparagement against titled nobility, so long as coronets and crimson robes are worn by noble-men.

But how many noblemen there are untitled—those who have set themselves to the task of accomplishing important work, and have spent their lives in that high enterprise; men who have sown good seed, but have reaped no harvest; who have planted trees, but have never reclined beneath their shadow; who have dug wells, without ever tasting of the cool spring. These men have lived, and laboured, and died; upon them no title has been bestowed, no grants voted, no honours given. Their names are unregistered in our peerage, and the College of Heralds is unconcerned about them. But what good work have they done for their fellows?

To some of these brave spirits—noblemen untitled—we draw the attention of our readers in

this book. The biographies are necessarily brief, but the endeavour has been made, and it is hoped with success, to furnish impartial and accurate information about the characters introduced.

We have traced the life-long labours of "Strata" Smith, in his zeal for British Geology; of Waghorn, seeking out in the face of much opposition the overland route to India; of Raikes, in his solicitude for the religious instruction of the young; of Coram, the bluff sea captain, in his care for outcast children; of Nasmith, travelling far and wide, a missionary to the "baptized heathen;" of Henry Martyn, in his devoted work among the heathen of India; of Scoresby, as a sailor and a clergyman; of the Brunels, in their engineering enterprise; of Cort, bankrupted and beggared by his discoveries; of Hall, the physical enthusiast, and Dick, the Christian philosopher; and Wilson, whose life was a long dying, but a life of cheerfulness and usefulness to man.

The lessons of these men's lives are plain and practical. They teach us that it is the bravest and best thing in the world to be unselfish—that the men who would do good must look for no earthly reward; but that in the very doing of the good there is a higher enjoyment and a nobler satisfaction than wealth or honour can bring with them. If we had to design a coat of arms for those men, it should be—stars *argent* in a field *azure*, the crest a cross, the motto, “Go thou and do likewise.”

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OUR UNTITLED NOBILITY

DR. WILLIAM SMITH:

THE FATHER OF ENGLISH GEOLOGY.

“No good will ever come o’ such ways!” that was old William of Over-Norton’s frequently-expressed opinion; “the boy will be no use to himself, nor others either; what is the good of his picking up here and there bits of stone, and chipping away at ‘em as if it were real earnest work; what will pound-stones, and pundits, and oven stones, do for him, without he knows the secret o’ making bread out of flint, and warm clothing out o’ grindstone? No; I won’t have patience with the boy when I see him loitering when he ought to be busy, and maundering over a stone when he ought to be at his book!”

Old William’s nephew and namesake was unquestionably a very singular lad. He was shrewd enough on some points, cheerful enough about

some things, but he had strange ways with him, that were not the best adapted to make either a thrifty farmer or prosperous grazier. In the grey light of the morning, in the purple glow of the evening, this boy might have been seen wandering about the neighbourhood of Churchill, Gloucestershire. Now sitting silent in deep thought under the shadow of some old tree, now groping amid a heap of wayside pebbles, now chipping at a stone fence, now idly turning a flint over and over in his hand, and eyeing it as curiously as though it were a diamond of the first water; now labouring industriously in clay or sand, and carrying home, as treasures, odd bits of flint and sandstone. No wonder old William, a thriving, well-to-do man, who knew well enough the worth of a day's toil, should write down this boy an idler. Not a mischievous lazy-bones, orchard-robbing, bird-nesting, nut-gathering, school-truant, who saw no use for books except as missiles, no use for slate and pencil except for delineations of pedagogue portraiture; no mere do-nothing, "lawrance"-afflicted idler, who liked nothing so well as an horizontal on the grass, and sun-bath, and hated perpendicularity and motion; but a whimsical idler,

always busy gathering stones and pebbles as if they were gold nuggets ; wandering and wondering, theorizing and speculating, talking, if he talked at all, of what was under the ground, and not of what would grow or feed upon it. Green fields and yellow uplands, pastures where fat cattle grazed, what were they to him ? They ought to have been everything, we imagine, for his father was a yeoman, as his father had been before him, and his father's father, and so was Uncle William—old William of Over-Norton, from whom some expectations were entertained of a pecuniary kind. Was it not more than hinted that “the ould man had saved a biggish bit o' money ?” and to whom should he leave it but to his nephew, always supposing the nephew deserved his patronage—which, alas, for said nephew's prospects, seemed improbable enough. Nevertheless the uncle could not help admitting that the boy had shrewd notions, not on fat beasts and pastures green, but on most things in a general way, and was tolerably practical and coherent on the subject of drainage, a very important subject to the agricultural interest.

This boy was William Smith, son of William

Smith; begotten of a race of farmers who had flourished in the rich lands of Oxfordshire and Gloucestershire for many a generation, singularly free from tooth-ache and emulative of the centenarians, sowing, and reaping, and thrashing; and rearing horses and cattle in that dear, delightful, easy, old-fashioned way that contrasts so strikingly with the fast age in which our lot is cast. The Smiths had intermarried with the Raleighs, said to be descendants of the gallant hero who lost his head at Westminster, and who certainly spell their name the same way. When one of the William Smiths married Lucy Raleigh, he obtained with her a marriage portion of £110; and received from his father, as a settlement on the bride, "one half-yard and a half-quarter of a yard land, arable, meadow, and pasture lands, situate in Churchill Field." When this piece of land was sold eighty years later it was valued at £700. But the subject of our sketch had little to do with this landed property. His father had married, not a Raleigh, but another Smith; Anne Smith, of Long Compton in Gloucestershire, an intelligent, prudent, virtuous woman, well-beloved by her son William, who in late years sketched a

pen and ink portrait of her from memory, and wrote some words of description—words which show how the recollection of his childhood was full of pleasure in his advancing years. His father he lost when almost too young to understand how great the loss must be, but he spoke of him afterwards with deep affection and respect. Poor Willie, left to his mother's care, who had enough to do with her three orphaned bairns, was sent to the village school. There he learned to read and write, and found that two and two made four ; but the agricultural mind was not in those days intent upon information, and a little learning was made to go a long way.

William Smith was bent on improvement. He did not propose to himself any very definite course of proceeding ; he did not plan out his life, saying, "Now I will direct my attention to drainage, I will then render myself famous as a surveyor ; I will practise as an engincer, receive, as some wealthy company's servant, a handsome salary, spend every farthing in prosecuting my geological studies ; travel over England and Wales at my own cost, making plans, and drawings, and models of the land ; wear out my life,

spend my fortune, bring myself to the brink of bankruptcy and beggary, in order to lay the foundation of geological science in England"—he did not, we say, argue thus with himself, and it may be, could he have foreseen it all, Smith's cattle and Smith's corn might have been better known than Smith's Geology, and that the county paper might at last have registered the death of a man who was universally respected and died worth money! However this may be, William Smith kept gathering his pound-stones, pundits, and oven-stones, and drew upon himself many a sharp rebuke from Uncle William. He cultivated a taste for drawing also—highly disapproved of by his uncle—and resorted to many ingenious expedients to obtain a little colour and brushes, with which to paint in glowing tints somebody's cottage with a style of his own. Then he began to read cheap second-hand books—money screwed out of unwilling Uncle's pocket—but hard thought-compelling volumes, that taught him no more of turnips or of mangel-wurzel than they did of legs of mutton or ribs of beef,—strong books, akin to the stones he gathered in his rambles, but waking up within him a yearning desire to discover what

the ground was made of, and how the various formations were arranged below the soil on which crops flourished and cattle fed.

The subject of drainage was, we have said, the only one which Uncle William would allow his nephew freely to converse with him upon ; and on this subject the youth exhibited so much practical sagacity that some of his suggestions were adopted with an eminently successful result. This set some of the farmers thinking—not by any means an ordinary process with the agricultural mind almost a century ago. Smith, in after years, used to tell a story of a friend of his, who inquired of a farmer why he did not attend the agricultural meetings ? “Why, noa, zur ; I have been thinking, zur, these agricultural meetings don’t do much good.” “I tell you what, my friend,” was the answer, “they have done some good, for they have set you thinking ; a thing you never did before in your life !”

Well, it was thought, young Smith having begun to set the mental machinery of Agricola in motion, that the youth might be useful to a Mr. Edward Webb, of Stow-in-the-Wold.

Mr. Webb was a surveyor, who united with

that employment the practice of an engineer, no uncommon thing in those days. He was a self-taught man, was pleased with William Smith, and readily gave him a place in his office. Smith spent a very pleasant and profitable period with his employer, his time professionally occupied in surveying, with a dash at engineering now and again, and a sly jest at other people's cost. For example, there was a certain man who endeavoured to construct a steam apparatus, and failed; forthwith Webb's office rang with the rhymes:—

“ Jonathan Hull, with his paper skull,
He tried to make a machine;
But he, like an ass, could not bring it to pass,
And now he's ashamed to be seen.”

The business of the office rendered it necessary for Mr. Smith—*Mister* is a title won by age, and the youth had attained to it—to make frequent excursions on surveying expeditions. He was very successful, in a business, practical point of view, a field-marshall of the theodolite; and he was no less successful in his own geological observations. He began to make drawings and plans; he constructed a model of the strata, with odds and ends, and “gum to represent real water.” Chalk, green sand, wealden, lias, new red sand-

stone, magnesian limestone, coal measures, mill-stone grit, carboniferous limestone, old red sand-stone, slates, gneiss, granite,—with all these he was cultivating an excellent acquaintance; other men might travel over England to describe its topography; others might tell of its vegetation, its climate; others might parcel it out into counties, and be content to enumerate the idiosyncrasies of the shires; he was resolved to go below the surface, to discover the secrets of the successive strata, to elevate the geology of Britain—at that time a mere collection of theoretical views and vague notions—to the dignity of a science. The more he investigated the subject, the more interested he became. Readily enough he undertook the surveyorship of a projected canal, for it made it necessary that he should travel far and wide over England to examine the physical condition of the country. Very successful was he. He brought common sense and great experience to bear on the question, and utterly rejected those fallacies which were then very generally accepted as truth.

It is related of Mr. Smith, that while engaged in some mining operations, it was proposed and

carried that the *divining-rod* should be employed, in order to ascertain whereabouts water might be found. He pointed out the utter absurdity of this superstition, but was overruled. A diviner was introduced with his sensitive rod, the inflections of which were to point out the direction of the waters. Smith filled his pockets with pebbles, and, unknown to the operator, dropped one wherever the rod indicated water. When the trial came to a conclusion, he politely asked the operator to go through the experiment again. His wish was complied with, and not to one of the former points indicated did the rod turn. Smith explained the absurdity. "If," he said, "the water hereabouts changes its locality so rapidly the less we have to do with it the better."

In association with the Somersetshire Coal Canal, Mr. Smith obtained a comfortable and comparatively lucrative engagement. He received, first of all, a guinea a day; then two guineas, then three. He spent it all. Not in lavish expenditure, not in prodigal waste, not in luxurious living and expensive company, not in any selfish indulgence, but in the prosecution of the one prominent and permanent purpose of his life—the

investigation of British Geology: a subject of the utmost importance to a country like our own.

Mr. Smith took up his residence at Bath, a charming retreat beautified by his great taste and skill at a trifling cost, where he made the acquaintance of the Rev. Benjamin Richardson, an ardent student of science, by whom he was introduced to the Rev. J. Townsend, a gentleman of scholarly attainments, and deeply interested in philosophical investigation. Among the select circle of men of genuine ability by whom he was surrounded, he soon became known as "*Strata*" Smith. His conversation was never so animated as when he spoke of inanimate things, never so lively as when discoursing on stones. He was resolved to publish the information he had collected; to give to England the story and picture of her own material wealth beneath the soil. But geological maps are expensive in the getting up; the cost of bringing out what Mr. Smith proposed would be three thousand pounds at the least. About this time (1799) England was literally throwing away millions. The French war was costing the nation an immense sum annually; Government obtained ample means for

the purchase of gunpowder, but could not afford to aid the laborious geologist. At a sheep-shearing festival at Woburn, Sir Joseph Banks proposed a subscription, and offered £50; but there was no enthusiasm, and Smith was still left to work out his book on his own resources. These resources became less by a misunderstanding with the Canal Company—a misunderstanding which brought Smith to London, where he settled. Here he was introduced to the Duke of Bedford, a liberal patron, of whom great things might fairly have been expected; but grim death, who has no more respect for a peer than he has for a pauper, laid his hand on the duke, and left the poor geologist not only to mourn a patron, but to weep for a friend.

Still hopeful, William Smith went on with his labours. This *Geology of England and Wales*, this strata delineated, must be brought out; but, alas! the enterprising publisher figured in the *Gazette*; there was no one ready to hazard the necessary funds; Government was far too busy with the preparation of a certain compound, the main ingredients of which are charcoal and saltpetre, to concern itself about oolitic formations or old red sandstone. The strata had waited for

thousands of years to be delineated, it might wait a little longer.

Mr. Smith patiently laboured at his business, and effected some very useful work. He astonished every one by the simplicity of his plans. It is related of a young rustic who went to see the great Garrick play the character of a ploughboy, that he came away much provoked: "Call that play-acting," said he; "why, I've seen the ploughboys do the like every day of my life!" In a somewhat similar spirit complaints were frequently urged upon the engineering operations of William Smith. When his services were called into request in connection with the Norfolk and Suffolk seabreach, all sorts of plans were proposed for the keeping out of that dread invader, the sea—timber iron-girded, stone-walls, anything *strong*, Smith's plan was simply to adopt that which he had seen in nature. Banks of sand and pebbles elsewhere kept out the sea; here were the materials at hand—the very action of the waves would only serve to consolidate the strength of the defence. It was tried, and succeeded admirably; but everybody said, "Why, anybody might have thought of that!"

At length, in the Waterloo year, Cary, an enterprising publisher, brought out Smith's book. It was a work of immense importance, extraordinary labour, and no little risk. Government, having a little time on hand after sending Napoleon to St. Helena, awarded a premium of £50 to the author !

Did not old William of Over-Norton speak truly when he prophesied no good to his nephew from pundits and pound-stones? His book was pushed, and excited a good deal of attention, but he, its author, who had spent the best years of his life in its preparation, what cared the world for him? Great was the value of his work, great the pains he had expended on it, great things in association with it he was still planning, still carrying out. His geological maps of the counties entitled him to ample reward, but reward was not forthcoming—not even help. And so he laboured on, unassisted, laying the foundation broad and deep of the science of geology. He laboured hard and spent freely, and poverty—grim gentleman-usher of the bedchamber of genius—was in constant attendance, inviting him to repose in the grave. This pleasant villa at Bath had to be resigned,

sold to strangers, the trees he had planted, the flowers he had tended, the ornamental water which he had introduced. Next must go the house in London, and, worst of all, the splendid collection of geological specimens which he had been busily collecting all his life. This was bought by the British Museum for a few hundred pounds, and Smith parted from them as from dear old friends.

No home in London, no home at Bath, no cases of geological treasures, Smith goes forth a wanderer, and the world loses sight of and forgets him. He was still engaged in professional pursuits, still earning his daily bread in the sweat of his brain, and devoted all his leisure, all his scanty means, for his means were, indeed, scanty, to the earnest passion of his life, Geology.

In 1818 Mr. Smith visited his native place. He had been absent from those scenes of his childhood for many a long year, he returned to them with the bitter experience of life's disappointments. His relations were still thriving farmers. Crops and cattle had made them prosperous; pound-stones and pundits had made him poor. Poor; well, poor is after all a doubtful

term. Would such men as Smith, Hall, Wilson, Raikes, Scoresby, all the peerage of untitled nobility, yield up the *wealth* which they had acquired, the wealth of good deeds done, for all the riches of the Lydian king? No; these men laboured for something better than material prosperity. Smith, for example, had revealed the geological strata of Britain; had laid the foundation of a new science; the fact of having accomplished this brought with it its own reward. He still had friends; still possessed sufficient means to allow of his moving from place to place in the prosecution of his studies; he had the satisfaction of seeing the principles which he had been the first to develop tested and proved. Somewhere about twenty years after he had published his book on the strata, years after his geological county maps had been issued, he was brought into further notice, and received such testimonials as learned and scientific societies could offer. A few more years still spent in geological studies, and the good man died! He had passed his whole life in diligent investigation of God's works, and could peacefully, calmly, resign his spirit into the hands of the beneficent Creator.

Towards the latter part of his life, Dr. William Smith—never was diploma fairer won—gave many interesting lectures on his favourite science. And a pleasant thing it was to hear that good old man, the FATHER OF ENGLISH GEOLOGY, reading to a crowded and attentive auditory his “Sermons on Stones.”

THOMAS WAGHORN:

THE PIONEER OF THE OVERLAND ROUTE.

FROM the earliest period of the world's history, India has attracted the attention of all other nations. Its ancient grandeur has expanded into apocryphal magnificence, and its wealth, real and fabulous, has aroused the envy and excited the cupidity of mankind. According to old historians, Sesostris, king of Egypt, penetrated into India, but his conquests do not appear to have been of lasting duration. Next came Darius, the Persian, who, on the authority of Herodotus, was successful enough to derive from the province of Hindostan an annual revenue equal to five hundred thousand pounds. Alexander the Great overran the Persian empire; kings and conquerors swallowing up each other,—even as the animalculæ in the water-drop devour and slay; carried his arms forward as far as Bactria, and followed up his

successes by the invasion of India. He had read in the ancient fables of Greece, that Bacchus and Hercules, strange allies, had attempted a similar experiment, and he who had wept for other worlds to conquer, was not to be outdone by gods or men. On entering India, the petty princes of the country made submission, and declared him to be the third son of Jupiter ; but he soon found that even all the thunderbolts of his sire, however brisk and active the Cyclopean manufacture, would be but of small account in subjugating a country doubly defended by nature and art. The city of Massago, the rock Aornas, the river Taxila, the army of Porus were overcome ; but every victory necessitated fresh conquests, and the chivalry of Macedonia, exhausted by fatigue,—for the gathering of laurels is no summer holiday pastime,—at length fell back, and the death of Alexander was speedily followed by the downfall of his eastern empire.

But the traditions of Indian wealth survived the empire, and for centuries the stories of its inexhaustible treasures and unexampled magnificence were kept alive. Everything which could excite the passions or warm the imagination was

related of India. It was a glorious dream-land, the earth of gold, the trees bearing precious stones, the rivers of richest wines, the palaces of silver and marble, and over all a delicious perfume instead of air. There the inhabitants dwelt in sunine and voluptuous indolence, an easy prey to foreign conquerors bent on their subjugation. Twelve different times, Mahmoud of Ghuzni invaded India. The fierce hordes of barbarians came down like vultures on a battle-field, and set up the Patan empire. Then came that wily Mogul, Zingis Khan, who left, as traces of his march, whole miles of slain. And next to him came Tamerlane, who pursued his conquering march, to Delhi, which was given up to massacre and pillage. The conquest of Timour, however, like that of Zingis, was not permanent. Sultan Baber was more fortunate, for he it was who laid the foundation of the Mogul empire, the last representative of which so notoriously figured in the atrocities committed during the Indian rebellion. Not that the Moguls maintained their authority intact. Nadir Shah fell on them, and utterly crushed their power. Meanwhile the English settlers, who had come over in Queen

Bess's time, were gradually making their influence felt all through the peninsula. The power of the British settlers, by its simple growth, was rapidly spreading over India. Like that famous tree, the descending branches of which take root in the ground and form new parent stems, so was this chartered company of London traders, increasing in importance and authority. At last, little more than one hundred years ago, an act of open aggression and a deed of wanton cruelty perpetrated by the Moguls, brought down upon their heads a speedy retribution. The pen of the diplomatist was cast aside; the sword leapt from its scabbard, and on the field of Plassy the affairs of India underwent the mightiest change which they had ever known. It is not essential that we should stop here to inquire whether or no we had the right, as unquestionably we had the power, to make ourselves the masters of India. It is a question which has already excited a large amount of controversy, but the fact remains the same, and as a fact, without comment, we let it stand. British supremacy was asserted, and step by step advanced, till Hindostan fell completely beneath

our sway, and Queen Victoria has been proclaimed the Empress of India.

A strange eventful history is that of India, full of the most startling vicissitudes. But of all the circumstances which are recorded in its annals, there is nothing so strange, so terrible, or so absorbing in interest as that of the recent mutiny. India has afforded a field of curious investigation to the historian and the antiquarian ; its physical geography, its flora, and its fauna, have occupied the attention of the naturalist ; the condition of its people, its infanticide, and Sutteeism have excited the benevolent exertions of the philanthropist ; the immense importance and inestimable value of the peninsula have won for it attention ; its facilities for commercial enterprise and trading speculation have occupied the time, money, and talents of our business men ; while its huge and fantastic system of idolatry, so interwoven with all the ordinary occupations of its people, as to appear inseparable from them, have called for the religious exertions of every Christian community. But every interest, of whatever kind, was shaken by that Indian mutiny. All the exertions of the philanthropist, all the efforts of the

Christian, all the prestige of the soldier, all the speculation of the trader, all the hopes of the patriot, all the schemes of the statesman, were threatened with destruction. The tide of rebellion rolled forward, and nothing but the fiat of Deity could give the command, "Hitherto shalt thou come, and no further, and here shall thy proud waves be stayed." Those blood-stained waves rolled back. India emerged as the waters assuaged; but everything had changed, and the aspect borne by the country, still trembling with its recent convulsion, was different from what it had been. The rivers, the rice-fields, the fan-like palm, the bamboo, with its graceful stems, the thick foliage of the mango, the gardens filled with splendid flowers, with giant creepers, and with trees that scent the air with perfume,—all these might be as singularly beautiful as they had been before; nature smiles when the storm is over, and hides her secret under her robe of flower-spangled verdure; but the memory of the past cannot be lost. Sultry Cawnpore, with its awful well—putrid Delhi, have associations belonging to them which cannot be forgotten. They are marked by atrocious massacre, and worse than

massacre ; the very names of those places call up a ghastly picture ; for there such things were done as seldom have been done, even by devil-inspired man, since fire from heaven rained on the cities of the plain. There is, however, connected with all this, some of the most splendid passages of arms that were ever recorded by the historian. We think with pride and gratification of those men of iron who stood firmer than a Macedonian phalanx, firm as a rock beaten by the impotent waves, against the apparently overwhelming numbers of the foe. We crown with laurel—alas, that the cypress should be entwined with the wreath!—those gallant leaders whose glance “thawed cold fear” in the breasts of the most timid ; and we unite right willingly in an acclaim to those who knew how to die, but did not know how to surrender. A small band, a mere handful of men, but they maintained the supremacy of England and the integrity of the British flag ; in the spirit of the hero of Agincourt, they seemed to have said :—

“ If we are marked to die, we are enough
To do our country loss ; and if to live,
The fewer men the greater share of honour.”

And now that the storm is over, that our Indian empire is established on a firm basis, India becomes even more interesting and attractive than before. All that can be learned about it is eagerly sought; we want to know more of the country, more of its people, more of its customs and manners. The civil service offers tempting places, there is every inducement to regard India with favour, and a general disposition to know all about it. Its sal-ammonia, and muslins, and calico, and diamonds, and indigo, and opium; raw silk, cotton, sugar, spices, Cashmere shawls, rice, pepper, gold, saltpetre; its teak and sandal-wood, its tobacco, hemp, and flax; its cinnamon, and castor oil, and pearls, and chintzes; its iron, copper, coal, to say nothing of borax, lapis-lazuli, and a host of other things, are full of interest for the manufacturer and trader; its cocoanuts, and pappaws, mangoes, pine apples, plantains, quaros, melons, oranges, limes, tamarinds, plums, dates, citrons, yams; antelopes, camels, elephants, wild boars, hyenas, ponies, leopards, panthers, snakes, lions, buffaloes, bears, one-horned rhinoceroses and tigers, have interest for zoologist and botanist, for man of study and for

man of sport ; its temples, Brahmin, Boodh, Seik, Moslem, Thug, Parsee, and others, are attractive to the antiquarian and historian, while they awaken the sympathy of the Christian. Everything about India is interesting, and books, ancient and modern,—Gleig and Heber, Macfarlane, Wilson, Orme, Alison, Elphinstone, Tennent, Marshman, Mill, Stoqueler, Turner, Justin, Pliny, Strabo, Diodorus, Murray, and Herodotus, are in great request.

Now there is one man's name in connection with India which deserves to be especially noticed—not as a soldier, statesman, writer, missionary, antiquarian, or trader—but for having shown us how to get to India by an overland route, and by steam communication.

The honour of having accomplished this object is due to the late Lieutenant Waghorn, whose whole life was devoted to the completion of his meritorious plan.

Thomas Waghorn was born at Chatham in the year 1800. He was the descendant of a good family, not particularly illustrious—and woe for us if we had none but illustrious families in the land, let us never be unthankful for the decent

mede of mediocrity—but highly respectable. He received a good plain education, and at twelve years of age was entered as a midshipman in his Majesty's service to begin life in the cockpit. No events of any great importance marked his early days. Nelson was dead, and the splendour of his naval exploits threw minor actions into the shade, and the state of Europe was being chiefly adjusted by battles ashore. However, the young middy managed to make himself known, and gained an almost unprecedented honour—that of being made lieutenant at the age of seventeen. The close of the French war, the banishment of Napoleon, the restoration of the Bourbons, and readjustment of the map of Europe by the men of the pen, put an end to the prospect of much further promotion in the royal navy, and consequently Lieutenant Waghorn transferred his services to the Honourable East India Company, then a really important power in the State.

While associated with the East India Company, he took his share in the Burmese war, being despatched with a flotilla to the pestilential shores of Aracan. This district extends along the western coast of the great eastern peninsula

of South Asia. The coast, in the central part especially, contains many good harbours, is much indented by creeks and studded with islands and rocks, which render the mouth of the Aracan River difficult to approach, especially during the period of the monsoons; but the unhealthiness of the climate is the chief drawback of the country. During the period of Waghorn's being on the station, the troops died in great numbers from intermittent fevers and other effects of malaria. His conduct in all respects during this trying season was most exemplary; he rendered all possible service wherever his good offices could be of use; availed himself of every opportunity of acquiring exact information as to the condition of the country; and gave evidence of the possession of daring courage and personal bravery of no ordinary kind. It will be remembered that when the British army invaded Burmah, and captured the important town of Rangoon, in the Delta of the Irawaddy, the court of Ava heard of the loss with surprise but without alarm. The Burmese had not yet been taught the superiority of European courage and military skill. So confident were they of capturing the whole British

army, that many of the court ladies made arrangements with the Burmese officers for numbers of white slaves ; the only fear was that the British would retreat before their enemies could have time to catch them. Waghorn took his share in giving the Burmese a lesson. They had to learn the humiliating truth that submission to the "white slaves" was their only prudent course, and so the Lord of the Golden Palace, as the monarch was styled, yielded up a large portion of his territory ; and Assam, Aracan, Yeh, Tavoy, and Tenasserim were ceded to the British.

On his return from the Burmese expedition, Lieutenant Waghorn devoted himself to the accomplishment of the great object which he had at heart, namely, the opening up of steam communication with the East Indies, and the establishment of a short and rapid journey across the desert. This project, the immense advantage of which to the commercial and political interests of the British cannot be over-estimated, instead of meeting with support, was not only disregarded, but absolutely opposed. Merchants and mariners seemed alike insensible to the utility of the scheme. They regarded the efforts of Lieutenant

Waghorn as futile, and as productive of no good results if practicable, and they offered formidable opposition to the execution of his plans. But in the face of difficulties and discouragements under which most men would have succumbed, Waghorn persevered. He was determined to succeed, and the public could not fail to have their attention drawn to his project. Distance he argued was a mere convertible term ; localities far away might be brought within easy range by facilities of travelling. India was England's mightiest dependency, and yet so far removed that no free intercourse could be maintained. A sea voyage to India in the old-fashioned sailing vessels occupied three or four months, exposed the passenger to much discomfort and to many risks. Why should this continue, when steam might successfully be employed, and the route to the East, to the fabled land of Cathay, be rendered both expeditious and convenient. Imagine this projector, warmly enthusiastic in his plan, going from place to place, writing to this man and to that, making interest with this functionary and the other, labouring at his scheme as if honour and reward were to be won by it. Wherever he went he was coldly re-

ceived. Shipping agents would not listen to him, would have nothing to do with his plan, would not hear him, nor read his letters, nor concern themselves in the least degree about it, except among themselves, as they passed the bottle, over that mad Waghorn, who would perhaps start a new route to the moon next, or establish a steam communication between Nothing and Nowhere! Parliament men had no faith in him, could not see the practicability of his plan, thorough Tories thought they could detect Radicalism at the bottom of it, and Whigs were satisfied it was a Conservative measure. Newspaper people did not come manfully to his help, but let him fight his own battle, and bravely he fought it—steam communication with the East, an overland route to India—the one sole object of his life.

In the year 1829 he was summoned before Lord Ellenborough, President of the India Board, and Mr. Lock, Chairman of the Court of Directors, and was instructed to proceed to India through Egypt, with despatches to Sir John Malcolm, Governor of Bombay. He got to Alexandria in twenty-six days, reached Trieste in nine days and a-half, being disappointed of a steam vessel

at Suez—a Government vessel which was not there, never having been sent on account of having broken her machinery, a fact which had been overlooked until it was too late for Wag-horn to know anything about it; but Wag-horn, finding no vessel there, hired an open boat, and, guided by the north star and the sun, arrived at Jeddah, a distance of 620 miles, in six days and a half. During this hazardous voyage, he satisfied himself that for every purpose of interest, politically, morally, and commercially, this was the proper route between England and the East.

For the discovery thus made Wag-horn received the cordial thanks of three-quarters of the globe.

But Wag-horn's work was not completed, it was only begun. When travellers arrived at Alexandria, the journey between that city and the Red Sea was one of very great difficulty. The desert had to be crossed. The traveller in the desert saw nothing but one vast sandy prospect bounded only by the sky; not a tree, not a shrub, not a flower, not a blade of grass—a banner of promise to wave in the air—sand before



THE PATHLESS DESERT.

"Sand before, and sand behind; sand on the right-hand, sand on the left."—Page 41.

and sand behind ; sand on the right hand, sand on the left ; sand stretching out as calm as a lake, or driven into waves like a stormy sea, whirling into sandy spouts like pillars of fire. In the midst of the stifling sand, one might form some idea of what was meant by the pathless desert. The camel was the ship of the desert, with its—

“ Load of precious things ;
Silks for merchants, gold for kings ;
Pearls of Ormuz rich and rare—
Damasceno and Indian ware—
Bale on bale, and heap on heap.”

So in solemn procession the camel caravans proceeded, romantic and mysterious enough in appearance, suggestive of old eastern stories, and of patriarchal days, but not in unison with the melody of our modern march of progress.

Lieutenant Waghorn resolved on the establishment of omnibuses on the desert, and the erection of stations on the arid waste. It was a daring innovation, and a great outcry was made against it. With the exception of some trifling assistance from the Bombay Steam Committee, he had to rely entirely on his own resources, but, nothing daunted, he determined to carry out his

plan. Eight stations, or hotels, were accordingly erected, at equal distances from each other, across the desert. Their number was afterwards increased. Omnibuses were built, each to contain six persons; four omnibuses forming a caravan, guards and coachmen appointed, and the first grand innovation made on the antique fashion of the Egyptian. The 'buses were not unlike bathing-machines at an English watering-place. The stations were plain buildings, but as comfortable, after European fashion, as circumstances would allow; and the improvement on the old caravans could not be questioned. Good beds were to be had at the central station, and some hours for rest allowed. All parties who arrived between six and twelve at night found supper prepared for them; between twelve and six in the morning, breakfast; for the remainder of the day, dinner. Thus comfortably housed, drinking pale ale and partaking of a well-served dinner, one could scarcely realize the notion of what desert travelling used to be in days of yore:—

“ In silent horror o'er the boundless waste,
The driver Hassan with his camels haste;

One cruise of water on his back he bore,
And his light scrip contain'd a scanty store ;
The sultry sun hath gained the middle sky,
And not a tree and not a herb was nigh ;
Shrill roar'd the wind and dreary was the view."

Such was Collins's picture of travelling in the desert, but Waghorn altered all that. The account of hotels and omnibuses in the grand desert was at first received with incredulity at home. People were very sceptical, and were disposed to regard the affair as a hoax, but it soon became well known that the project of Waghorn had been absolutely accomplished, and that the projector was superintending the whole of the arrangements in person, with small prospect of pecuniary reward and the certainty of a shattered constitution. He provided vessels for the conveyance of passengers on the Nile and Mahmoudie Canal, and worked the overland mails to and from India, from 1831 to 1834. In the February of the latter year, he succeeded in carrying letters from Bombay to England in forty-seven days, without any steam from Alexandria to London.

Lieutenant Waghorn pointed out three dis-

tinct routes to India: the route *via* Trieste, namely, from London to Dover, Dover to Calais, so to Paris, Lyons, Turin, Milan, Venice, Trieste; a mail route through the Papal States *via* Ancona; and another route by way of Genoa. He not only explored these routes himself, and opened up highways to India until his time never dreamed of, but he set to work other active intelligences, and to his exertions the honour is fairly due of having served as our great national pioneer to the East.

Now, the steam vessels of the Peninsular and Oriental Steam Packet Company proceed from Southampton two or three times a month, touching at Gibraltar and Malta on their way to Alexandria. Routes are also opened through Ostend, Brussels, Cologne, Mentz, Lucerne, the Rhine and Milan; also through Paris, Strasbourg, Baden, Zurich, Chur, Collico, and Como. There are in all about thirteen different routes which may be taken to reach Alexandria. The railway and electric telegraph are opened between Alexandria and Suez; Waghorn omnibuses are consequently dispensed with, and instead of hotels, there are refreshment-rooms on the line; but it is to Wag-

horn that all this is to be traced, he it was who first marked out the way which others have trodden and improved.

This man, having spent his life, his whole energies, exhausted his means, ruined his health, in the cause of his country, was at length rewarded with a pension. But it was not granted to him till his end was fast approaching. He received but one quarter's allowance, and so he died at Pentonville—worn out in his country's service—an old man at the age of forty-nine. Titles and honour, pensions and broad acres, are freely given to men of whom the majority of their fellows have seldom heard, and whose utility to the world at large it would be difficult to point out. Blanks and prizes are dealt out with a very unequal hand. The true men whose lives have been devoted to the advancement of civilization, the extension of freedom, the amelioration of human suffering, the alleviation of human woe, are left in obscurity. They do their work and die, but there is about such men a dignity which can never be bestowed by letters patent:—

“A prince can mak’ a belted knight,
A marquis, duke, and a’ that ;
But the *useful* man’s above his might,
Guid faith, he mauna fa’ that !
For a’ that, and a’ that,
Their dignities and a’ that,
The pith o’ sense, and pride o’ worth
Are higher ranks than a’ that.”

ROBERT RAIKES :

THE FOUNDER OF SUNDAY-SCHOOLS.

EIGHTEEN hundred and fifty-one was the year of the Great Exhibition. A fairy-like palace—the first of its kind—had been erected in Hyde Park :—

"A rare pavilion such as man,
Saw never since mankind began
To build and glaze."

In the autumn of that same memorable year there was a great exhibition at Manchester. Not an Art Treasures Exhibition, not a display of painted pictures by masters new and old, and yet it was an exhibition of the schools—schools unknown to art critics—not the French, Spanish, Italian, Dutch, Flemish schools—certainly not Pre-Raphaelite ; belonging, in fact, to the English of modern time. It was the Sunday-school that was there exhibited in Peel Park, and inspected by the Queen and her royal Consort.

Peel Park, Salford, presented a particularly interesting spectacle on that 10th day of October, 1851. Immense platforms had been erected, the principal one extending across the park, describing a slight concave; two smaller ones, ranged parallel with the front of the large one, with a carriage drive between them. Any one who was curious as to statistics might have learned that the erection of these platforms had cost a thousand pounds; that the quantity of wood supplied was 9000 cubic feet of American timber, and 130,000 square feet of three-inch planking; that the principal platform was 200 yards long and 27 yards wide, rising four yards and six inches; that its area was 5400 superficial yards, and formed an amphitheatre, which was struck from a radius of 466 yards; that the top and sides of the platform were railed round with substantial railings three feet high, inclosed with three-quarter-inch boarding, eighteen inches high; that the two minor platforms were constructed on the same principle, thirteen yards wide, and rising only three feet six inches high, being separated in the centre by an opening twelve yards wide. But it is probable that only few people would care for

this heavy load of figures ; enough for the spectator to know that 80,000 children were to occupy these galleries and level spaces ; enough to see the youngsters—right loyal infantry—marshalled to their places, and rising up like a great bank of beautiful flowers, on which the sunbeams fell as with a loving tenderness. God bless their innocent faces, how hopeful and joyous they looked that day ! Unlike the children of whom, in passionate strains, the poetess has sung—children who look up with pale and sunken faces, man's grief graving the cheeks of infancy, seeking death in life as best to have :

“ ‘Your old earth,’ they say, ‘is very dreary ;’
‘Our young feet,’ they say, ‘are very weak !’
Few paces have we taken, yet are weary—
Our grave-rest is very far to seek.

“ Ask the old why they weep, and not the children,
For the outside earth is cold ;
And we young ones stand without in our bewildering,
And the graves are for the old !”

Not with such melancholy thoughts do we regard these children, not such plaintive strains would these children express ; for them Benevolence has put forth its fair white hand, and Love has smiled and pointed upward to the skies, and taught them

something of His nature and His constant care wh
watches over all things. How grand the song
these children raise ! How the music, gathering
strength as it goes on, rolls upward to the skies !

“Crowned by a nation’s love,
Guarded by Heaven above,
Long live the Queen !

“Long may each voice exclaim,
Wide as Britannia’s fame,
Long live Victoria’s name—
God bless the Queen !”

How the children shouted when they saw the Queen and Prince, the Prince of Wales and Princess Royal ; not a trifling huzza, no weak *viva*, but a burst of loyalty, immoderate, overpowering. The Queen was delighted, and freely recognized the affectionate welcome given to her by her youthful subjects. They were but poor children, taught in Sunday-schools the religion and loyalty of the Bible, they cost the Government nothing, their teachers were unpaid ; all expenses were by free-will offerings. What country in Europe, except our own, could exhibit such a spectacle ?

In looking on a scene such as that which Peel Park offered on that memorable October day, the spectator would be naturally led to inquire into

the circumstance which led to the institution of these schools. Sunday-schools are now to be found almost everywhere. All dissenting denominations, as well as the Established Church, have these schools attached to their places of worship; and schools of the same kind, independent of any particular place of worship, are prosperously conducted by teachers who waive all sectarianism to teach our common Christianity. How came we to have Sunday-schools? Like the beginning of all great institutions, the origin of Sunday-schools is traceable to the Christian devotion of one man.

On the 14th of September, 1736, Mr. Raikes, a printer and publisher of the city of Gloucester, was blessed with a son, who was baptized by the name of Robert. Robert Raikes received a plain education, but was well instructed in religious truth; he was taught his father's trade, and ultimately succeeded to the business. The annals of business life are commonly "short and simple," and in this respect there is little to distinguish the career of Mr. Raikes from that of any other trader in Gloucester or elsewhere. But every person has, or ought to have, an individuality—

certain tastes and inclinations properly belonging to themselves. Great politicians there may have been in Gloucester, who, in the warmth of debate on the French war, or the revolted colonies of America, may have been quite different sort of people from what they were behind the counter, at the desk, or on the shop-board. Others there may have been who cared not for politics, but who, apart from common daily toil, liked nothing half so well as talking of the great men of the time—Samuel, Johnson, David Garrick, Oliver Goldsmith, Sir Joshua Reynolds. But though Robert Raikes might have been able, and doubtless was as well able to discuss politics, literature, or art, as the biggest talker in Gloucester, it appears that he gave himself out of business hours, ay, and in them also, to the blessed work of doing good.

Raikes was a man of devoted piety. His heart was open to the appeal of the distressed, his hand ready to supply the wants of others. Of the few worshippers who gathered daily in the spacious, grand, and imposing cathedral, he was one; he also was a constant visitor to Gloucester jail, alleviating the condition of its unfortunate inmates,

and endeavouring to lead them into the paths of virtue. In the prison cells he was brought into contact with offenders of all ages ; old thieves who had grown hardened in their sin, and others who still retained some sense of shame, and wept when they thought of the pleasant days of youth, before misery and folly had led them into the hard paths of the transgressor, and built up a barrier between them and honest men. An observant man could not fail to notice that most of these old offenders had committed their first crime through ignorance, misfortune, or the influence of bad example. It occurred to Mr. Raikes that the children of the poor were not sufficiently educated ; that they were left too much to themselves, until society was forced to protect itself against them. What were jails doing to amend young criminals ? Were not these jails the hotbeds of impurity ? An innocent, unsophisticated child might well be affected by the moral impurity of the prison atmosphere ; how much more liable to be infected by it were those who were already predisposed for the disease. *The class* to whose miserable condition the mind of Robert Raikes was especially directed, was far different from that

of the children who now occupy our Sunday-schools. They resembled more closely the youth comprehended in the ragged school movement; the untaught fledgelings of whom jail birds are made.

One morning Robert Raikes had occasion to visit the suburbs of the city, an obscure quarter where the poor made their homes. He wished to hire a gardener, and the man lived in the heart of the pin-manufacturing district. He was from home when Mr. Raikes arrived, and while waiting the man's return, a troop of boisterous children considerably annoyed him. They were vile, wicked children, whose language and gestures shocked his sense of propriety. Wild, tattered, unkempt, old in their childhood, poor scarecrows in appearance, redolent of filth and sin, and shrieking, blaspheming, sometimes in anger, and sometimes in jest. Mr. Raikes had seen young Hopless immured in jail, but had never before witnessed young Reckless in his merry moments. His heart sickened, and he asked—

“ Do these children belong to this part of the town; is nothing done for their misery and idleness?”

"Ah, sir!" said the woman to whom he spoke, "could you take a view of this part of the town on Sunday, you would be shocked indeed; for then the street is filled with multitudes of these little wretches, who, released on that day from employment, spend their time in noise and riot, playing at chuck, and cursing and swearing in a manner so horrid, as to convey to any serious mind an idea of hell, rather than any other place."

"Now," thought Robert Raikes, "what is there to be done? We build prisons, and pay jailers and constables, we keep a watchful eye on young thieves, shut them up in cells, scourge them, let them mingle freely with older offenders than themselves, and then turn them loose on society. We have tried everything but teaching. Suppose we tried that—taught these children their duty to God and man. But how can such a work be done?"

TRY!

That word Try was so forcibly impressed on his mind as to induce him to make some immediate effort. "I can never pass by that spot," he said years afterwards to Joseph Lancaster, "where the word 'try' came so powerfully into my mind.

without lifting up my hands and heart to heaven in gratitude to God, for having put such a thought into my head."

TRY: whatever be the work in hand, it is the motto which furnishes a noble incentive. The day was almost lost on the field of Marengo, when Napoleon, observing an apparently impregnable position of the enemy, called young Dessaix to his side, "Can you carry that point?" asked the Emperor. "I will try," was the answer. He tried, succeeded, turned the fortunes of the day. What if his life went for it? It is not necessary to live; but it is necessary to live nobly.

The method adopted by Mr. Raikes in *trying* to carry out his benevolent object, was by engaging persons who had been accustomed to instruct children in reading, and by paying them to receive and instruct such children as he should send to them on Sundays. He paid these persons—poor females, selected with the approbation of the clergymen—one shilling each. The children were to come soon after ten in the morning and stay till twelve; they were then to go home, and return at one, and after reading a lesson they were to be conducted to church. After church they

were to be catechized in the Church Catechism, the clergyman of the parish occasionally looking in to examine the progress they had made. They were to be dismissed at half-past five, "with an injunction to go home quietly, and by no means to make a noise in the street."

To those who are accustomed to a well-regulated Sunday-school of the present day, its large cheerful room, separate classes for instruction—from the infant class, where the box of moveable letters and large coloured pictures give interest to the lesson, to the adult Bible class in a separate room—the Sunday school as introduced by Robert Raikes would afford a singular contrast. Great things are seldom great in their beginning. The Thames, at its rise in Gloucestershire, is very different from the same river at the Nore; so the Sunday-school system at its rise in Gloucestershire, is very different from the same system whose ample flood has converted a barren desert into a fruitful field. It was about the middle of the year 1780, when the women employed by Robert Raikes first set about their task; that the undertaking was good there can be no doubt, and its effects were such as to warrant the expression

that the place where the great school was opened was like a heaven on earth compared to what it had been.

Mr. Raikes thoroughly devoted himself to the Christian work he had undertaken. He was remarkably fond of children, and was well versed in the ways of access to their hearts. The following anecdote is illustrative of this phase of his character. He called on a poor woman one day and found a very refractory girl crying and sulking. He began to talk seriously to the child, and told her that as the first step to amendment she must kneel down and beg her mother's pardon. The girl continued sulky. "Well, then," said he, "if you have no regard for yourself, I have much regard for you. You will be ruined and lost if you do not begin to be a good girl; and if you will not humble yourself, I must do it for you." With that he knelt down on the ground before the child's mother, and putting his hands together continued: "Pray forgive," etc. No sooner did the stubborn child see him on his knees on her account, than bursting into tears she earnestly entreated forgiveness.

In a very interesting letter written to Colonel

Townley about three years after the foundation of Sunday-schools, Mr. Raikes describes the effects as most gratifying and encouraging. "The numbers," he says, "who have learned to read and say their catechism are so great that I am astonished at it. Upon the Sunday afternoon the mistresses take their scholars to church—a place into which neither they nor their ancestors ever entered with a view to the glory of God. But what is more extraordinary, these little ragamuffins have in great numbers taken it into their heads to frequent the early morning prayers, which are held every morning at the cathedral at seven o'clock. I believe there were near fifty this morning. They assemble at the house of one of the mistresses, and walk before her to church, two and two, in as much order as a company of soldiers."

It deserves to be remarked, that all the Sunday-schools with which Raikes was personally concerned, were placed under the superintendence of the parochial clergy, and attached to the Established Church. It has been asserted sometimes, that the founder of Sunday-schools was a Dissenter; this is a mistake, Mr. Raikes was a *Churchman*. In a letter on this subject, written

by his nephew to Sir William Cockburn, he says:—"My venerated uncle was not only a member of the Church of England throughout the *whole* of his life, but also a most attached and devoted one. I should much doubt whether he *ever* entered a single place of worship unconnected with the Establishment; and he was uniform in his attendance at the parish church on Sundays, frequent in his attendance at the early prayers in the cathedral on week days. His memory is still cherished by some of the oldest inhabitants of Gloucester, who remember that, though his mind overflowed with charity and goodwill to men of *all* denominations, his affections and allegiance were always with the Church of England."

As proprietor and printer of the *Gloucester Journal*, Mr. Raikes was enabled to give publicity to his philanthropic scheme. The matter was taken up by other local and by the London papers. The excellent example of the Gloucester printer was copied in different parts of the kingdom. A Sunday-school Society was established in London, William Fox, Jonas Hanway, Samuel Thornton, and Henry Hoare taking part in its proceedings. The Revs. John Wesley and John New-

ton, and the poet Cowper, stated their conviction that Sunday-schools were well calculated to promote the moral and religious welfare of the people. The most formidable obstacle to the progress of the system of Sunday education was the cost. Following Mr. Raikes' example of paid teachers, about one and sixpence each Sunday was given to the masters and mistresses employed; this never worked well. Gratuitous teachers were required, and volunteers were soon found ready to carry on the work more efficiently than could possibly have been compassed by paid agency. It has been shown by Mr. Watson in his admirable "History of the Sunday School Union," that to remunerate the present number of teachers, at the rate of one and sixpence each Sunday, would amount to about £975,000 per annum!

Towards the end of the year 1786, Mr. Raikes was greatly gratified by the good effects produced in the parish of Painswick, by the establishment of Sunday-schools. Then it had been the custom to celebrate an annual festival attended with every kind of vice and debauchery. Instead of this the day was passed in the examination of the Sunday scholars. "Drawn up in a rank around the

churchyard," says Mr. Raikes, "appeared the children belonging to the different schools to the number of three hundred and thirty-one. The gentlemen walked round to view them. It was a sight interesting and truly affecting. Young people, lately more neglected than the cattle of the field, ignorant, profane, filthy, clamorous, impatient of every restraint, were here seen cleanly, quiet, observant of order, submissive, courteous in behaviour, and in conversation free from that vileness which marks the wretched vulgar."

Robert Raikes might well experience an honest glow of satisfaction in beholding the result of his labours. He saw the system which he had introduced extending its ramifications all over the country—a social banyan whose leaves were for the healing of the nations. He knew it to be commended by the wisest and best of men, all of whom agreed with Adam Smith that no plan had promised to effect a change of manner with equal ease and simplicity since the days of the Apostles.

For nearly thirty years the founder of Sunday-schools lived to witness the beneficial effect of his benevolent undertaking. For two years previous to his death his health visibly declined. On the

evening of the 5th of April, 1811, the oppression in his chest increased to an alarming extent, and his case was declared hopeless by his medical attendants. He died peacefully, as a good man should die.

“Lift not thou the wailing voice ;
Weep not, ‘tis a Christian dieth,
Up where blessed saints rejoice
Ransomed now the spirit flieth ;
High in heaven’s own light he dwelleth,
Full the song of triumph swelleth :
Freed from earth and earthly failing,
Lift for him no voice of wailing.”

“I am the Resurrection and the Life,” saith the Lord ; “he that believeth in Me though he were dead, yet shall he live : and whosoever liveth and believeth on Me shall never die.”

They laid him down to sleep in the south aisle of the church of St. Mary de Crypt, Gloucester, and a plain monument, appropriately inscribed, was raised to his memory. But the founder of Sunday-schools required no other monument than that which his work supplied. In France, Holland, Gibraltar, Malta, Switzerland, even in Italy, Sunday-schools are established ; in India, China, Van Diemen’s Land, New South Wales, South

Sea Islands, in Africa, and throughout America and the West Indies, there are Sunday-schools—hundreds of thousands of unpaid teachers have laboured and are still labouring in the instruction of millions of children ; the Bible their text book, Christianity their creed, the glory of God and the salvation of human souls their object ; their charter boldly written in the Saviour's words, “Suffer little children to come unto Me and forbid them not, for of such is the kingdom of heaven.” The origin of this great work is traceable to Robert Raikes, and to his inflexible determination in pursuing this one object—his resolve to make a bad world better, or at least to try.

DAVID NASMITH:

THE FOUNDER OF THE CITY MISSION.

the twenty-first of March, in the year 1799, David Nasmith was born in the city of Glasgow. He was the son of respectable and pious parents, and was baptized at the College Church by Dr. Love, one of the original secretaries of the London Missionary Society.

At the age of seven David was sent to the City Grammar School, but he made very little progress, entertaining an aversion to the learned languages, which it is probable he made no strenuous effort to overcome. He spent four years at school, and learned nothing; at the end of that time, when his parents proposed sending him to the university, they discovered that he was totally ignorant of the rudiments of Latin and disinclined for an academical career. The course of his education was consequently altered. He was taught those things only which were likely to be useful to

him in ordinary business. These he readily acquired, diligently applying himself to their attainment, so as to be fitted for the duties of active life.

On the completion of his fourteenth year, David was bound apprentice to a manufacturer, an upright, worthy man ; who, on retiring from business shortly after young Nasmith entered his service, transferred him to his brother-in-law, with whom David remained three years. During this period he became deeply impressed with religious truth ; he was much troubled in mind ; disturbed in his dreams by night, and tempted to put an end to his existence. His mental sufferings at this time he has described in language which shows how severe the trial must have been. It is not, however, to be supposed from this that David Nasmith was guilty of any open vice, or that he was neglectful of religion. On the contrary, he had been piously educated, had attended a Sabbath school, and with some young friends had assisted in the formation of a society for the distribution of Bibles among the poor : religion was to him so great, and true, and he was so apprehensive of being led into hypocrisy, that his experience, like that of most other sincere and

thoughtful people, was at first distressing. There was a storm in his heart which could only be hushed by the voice that of old spake to the troubled waves of Galilee, saying, "Peace, be still!" And that word was spoken. David became decidedly religious; he joined the church in Nile Street, Glasgow, and soon afterwards began to feel that anxiety for the religious welfare of others by which he was characterized through his life.

HOW TO BE USEFUL! That was the thought uppermost in David Nasmyth's mind. He was but sixteen, yet his heart yearned after the happy labour of making others happy—the blessedness of giving. All through his long and laborious life his constant prayer was that he might be eminently pious, eminently useful. The missionary work appeared to him to offer a wide field of usefulness. He aspired to be a preacher, and with this object in view diligently applied himself to study. After mature consideration he made known to the minister whose church he attended his desire to become a missionary. His wish was communicated to the managers of the Theological Academy, and he was summoned before

them ; but those "fathers in Israel" could detect no spark of latent talent in the poor trembling lad whose heart was on fire, and they refused to assist him. It was a severe disappointment, but it had its uses, it taught him the important lesson of submission.

HOW TO BE USEFUL ! It was the thought still uppermost in David's mind. If the work of foreign mission was denied him, there was still work to be done. But he was not in a position to give himself up to philanthropic labour ; he must earn his bread ; and, disappointed in the hope of being received into the Theological Academy, he had to seek for employment whereby to live. He had left his business, and a situation was hard to find ; but he at length obtained an engagement, and entered on its duties with intelligence and industry. But the duties of the desk or counter could not fill up his mind or heart. How to be useful ? that was the question continually recurring, and suggesting practical methods of doing good. The Sunday-school furnished opportunity for the exercise of his zeal and patience. Every Sabbath evening he addressed two hundred children. The wants of the adult population were not forgotten,

NASMITH A JAIL VISITOR.

and schools for them were especially established ; the inmates of the Bridewell and Glasgow jail excited his compassion, and we find this poor clerk, but yet twenty years old, pouring religious instruction and spiritual consolation into the ears of hardened criminals condemned to die.

Ample opportunities were presented whereby this youth could be useful, though he was never to carry the Gospel message to the children of Ham ; the heathen of our cities had claims on him as strong as those of the heathen of Africa. He soon realized this idea, and devoted himself more earnestly to the work he had taken in hand. He had many troubles. In very humble circumstances, he was often denied the privilege of giving that temporal relief which he would have been glad to give ; pressed for time as well as for money, he could not devote so much of his life as he would have done to his labour of love. And then there were home troubles, for his brother was falling into irreligious and vicious courses, and had become the source of great anxiety to his relations. And added to this there were heart troubles ; for David loved a pious and amiable woman, who, respecting and esteeming him as a man and a

Christian, declined his proposals as a suitor for her hand.

In the autumn of the year 1821, David Nasmith read an advertisement in the Glasgow papers which decided his future course.

“Clerk Wanted.—A person acquainted with books and accounts, to act as Assistant-Secretary to the Religious Societies connected with the Institution Rooms, No. 59, Glassford Street, to whom liberal encouragement will be given. None need apply but such as can satisfy the Committee that their character is unexceptionable, and that they have the interests of such societies at heart. Applications, with reference as to abilities and qualifications, to be lodged, before the 8th of November next, at Messrs. Chalmers and Collins', No. 68, Wilson Street, addressed to the Committee of said rooms.”

HOW TO BE USEFUL! Here was the answer. David saw in the situation thus offered a promise of the realization of his long-cherished hope, namely, that of devoting his whole time to benevolent and religious purposes. He offered his services, and was accepted, at a salary of *sixty pounds per annum*. It was a small sum for three-and-

twenty societies unitedly to offer for the services of a talented, trustworthy man ; but David cared nothing whether the salary were little or much, it was the congenial employment which attracted him to become the chosen servant of humanity and religion. He entered on his duties encouraged by the hope of being useful, and this hope was fully realized. During his connection with the Institute he was brought into association with the most distinguished men of the city, whose companionship could not fail to refine his manners, enlarge his views, and elevate his character. He owed much of his manly bearing and easy courtesy to the society into which he was introduced in consequence of his official position ; but although admitted to a higher sphere than that in which he had hitherto moved, his modesty and devotion remained the same.

Among other labours in which David Nasmith engaged in Glasgow, was that of the formation of young men's societies. He was fully alive to the importance of enlisting the sympathies of the young on the side of truth and virtue. During the course of his life he formed about seventy of these societies, consisting of young men between

the ages of fourteen and thirty-five, meeting for the purposes of mutual improvement and benevolent exertion. But devotedly attached as he was to the promotion of young men's societies, his primary object was still missionary—a mission to the neglected heathen of our cities, the home pagans, who sit in darkness, squalor, and misery; who taint our moral atmosphere, and fill our gaols with criminals—the unchristianized millions who are overlooked too often and too much by those whose benevolence expends itself on objects far removed. With *City Missions* Nasmith's name is indissolubly associated. In the great work of their formation he spent his life.

The spirit of the City Mission was thoroughly Catholic. All denominations of Christians were to unite in it; the work was to be carried on by paid lay agents, who should visit the poor at their own houses for religious conversation, the distribution of tracts, and the reading of the Scriptures. The first society of this kind formed was at Glasgow, in 1826, and it became an immediate favourite with the public.

Three months after the formation of the Glasgow City Mission, David Nasmith married. The

lady, daughter of Mr. Francis Hartridge, of East Farleigh, Kent, was then carrying on business in Glasgow. They were admirably adapted to each other, and for the privations and trials which lay before them ; both were devoted to the cause of religion ; both equally bent on being useful ; both in all respects qualified to carry on the work which lay so near their hearts.

Two years after his marriage, the health of David Nasmith began to fail. His energies were over-taxed ; he was sinking from exhaustion ; and at the same time was impressed with the idea that he was called to labour in a wider sphere of operation than that which Glasgow afforded. He was compelled to keep the house, to cease for awhile from all exertion ; it was obvious that he must have assistance if he again attempted the labours of his office. What was to be done ? Resign. David was in no pecuniary position to throw himself out of employment, but this formed no part of his calculation when he was once satisfied that the course he adopted was the right one. He accordingly sent in his resignation, which was received with regret, and acknowledged with many flattering testimonials. A few friends sent

him sixty pounds, a sum which was very acceptable. From this time David Nasmith went forth as a missionary without funds; a philanthropist who had everything but money to make him another Howard; a man who voluntarily "went about doing good," spending the little he had, the little his wife's business brought by its sale, and depending on the unsolicited assistance of Christian friends.

Nasmith went to Dublin, and there formed a City Mission. There it seemed probable he would settle. His earnest zeal and unaffected piety won for him many friends, but he was not thoroughly convinced that his path of duty led him to remain in Ireland. It was an anxious time for him, and for his wife, who was then residing with her father in Essex. There David spent a few weeks, thence returning to Glasgow to settle his affairs, for something must be done, and done speedily. He resolved to return to Ireland, and took an affectionate farewell of his Scottish friends. "I desire," he writes, "to be extensively useful to the church with which I may be connected, to the circle of acquaintance that may be given to me, to children, to young men, to students of divinity,

to the poor, to the inhabitants of Dublin, to the inhabitants of Ireland at large." Might he not have said to the world at large?

So David Nasmith and his wife went forth, leaving country and kindred, house and home, on a precarious means of livelihood, secured by no guarantee whatever, except—there was much in that exception to David's mind—the assurance that the universal Father will never leave nor forsake those who put in Him their trust. In Ireland David Nasmith laboured very successfully, and it appears from his letters that he was very happy; he travelled over the south and north, founding useful institutions and holding important meetings, and was everywhere well received. Ireland, however, soon became too small a field for his labours; he resolved to visit America. He felt, he says, that he should be more useful in going to a country where few, if any, City Missions exist, than he should be in remaining in Ireland, where already twenty missions had been established.

After a brief visit to Glasgow, Nasmith, with his wife and infant son, set sail from Greenock on the 27th of July, 1830, for New York, where

they arrived on the 3rd of September. The peculiarities of American society were in many respects distasteful to our missionary, the mixed company of the boarding-house, so unlike the domestic quiet to which he had been accustomed, suited him not at all; but he set about his work in good earnest, and forgot all petty annoyances in laborious occupation.

A City Mission was speedily founded in New York; this was followed by visits to Newark, Jamaica, Newport, Providence, Boston, Midford, Andover, Bradford, Salem, Marblehead, Newbury Port, Portsmouth, and Portland. In all of these places Mr. Nasmith assisted to awaken a missionary spirit and to found, in some instances, City Missions. He laboured incessantly for three months, bearing his expenses out of his own slender means. At the end of this time he determined to visit New Orleans, the focus of slavery. After paying his passage, he took with him one hundred dollars, little more than twenty pounds, to pay his way back, 1800 miles by land. His wife wished him to take more, but he refused, feeling confident that he should meet with assistance on the way. He says: "A Christian friend

who accompanied me to the ship, seeing me get a draft upon New Orleans for one hundred dollars, after leaving me returned and put into my hands his order, in the name of the house of which he was a partner, upon a house in five of the different places through which I have to pass, desiring them when I applied to give me one hundred dollars. This sum, of course, should I find it necessary to avail myself of his order, must be repaid."

David Nasmith carried with him letters of introduction from friends in New York to friends in New Orleans. The condition of society in that city was a source of surprise and grief to him, as he contrasted the mode of spending the Sabbath-day there with what he had been accustomed to in Glasgow. He had never witnessed desecration carried so far. The mortality also amongst the inhabitants, especially the young and profligate, saddened him, together with the constant exhibition of slavery, which he well describes as "indeed a great curse to the land." He was not, however, to be deterred from the execution of the purpose which had brought him to New Orleans. He proposed the establishment of a City Mission. Many were the obstacles to be overcome, but he

had no political design to answer in landing in France; but with the help of a translator they were convinced at last, and David was permitted to go on to Paris, after presenting each of the soldiers with a religious tract.

In the gay city of Paris David Nasmith founded a City Mission; he subsequently visited Havre and founded a mission there also. His success was equal to anything that he had anticipated, and he returned with the pleasant conviction that he had rendered some permanent service to the cause of religion in France.

But as time wore on the necessity of doing something for himself, as well as for others, became more obvious. He was a husband and a father, and the cares of home were pressing. He was not in want; the little money he possessed when he gave up his situation in Glasgow had been as the barrel of meal and cruse of oil to the widow of Zarephath. His friends saw that something must be done for David; but he was not a man to be easily led into the adoption of any plan but that which he felt to be right. He might have obtained situations of trust in association with religious institutions, but he felt himself un-

able to submit to the trammels of office, and unwilling to have his talents and time monopolised in any one object, however good. He might have entered on mercantile life, and prospered; friends there were ready to assist him with funds, but this he positively declined. His plan was to set up an establishment in Glasgow, for the purpose of assisting philanthropic individuals and societies. A registry of lodgings and situations vacant were to be kept, with the names of those of good character who wanted places; committee-rooms were to be formed for the transaction of business, a reading room opened, arrangements were also to be made for recording the proceedings of meetings, filling up and delivery of notices, issuing reports, circulars, and periodicals, collecting subscriptions, receiving contributions, etc. The idea was good, but it wanted money to carry it on. David Nasmith entered on it boldly, but he had not the means of continuing it until success brought the reward; it failed and he lost his little all.

Thus circumstanced, but never losing his confidence, Nasmith went to Ireland. There he found kind friends, to whom he communicated his desire to attempt a mission work in London.

They offered him such assistance as they could give, endeavouring to secure to him an income of about £200 per annum. This was to be raised by subscription, and of course there was no guarantee provided that it would ever be carried out. Nasmith, however, was encouraged to proceed to London, where he arrived on the 24th of March, 1835. He took a house at Hoxton, and prepared for the great work which he purposed carrying on in this city.

David Nasmith's principal difficulty in establishing a London City Mission arose from the differences existing between the Established Church and the Dissenters. Either would have promptly adopted the plans proposed could they have acted alone, but evangelical alliance was what the Scotch missionary insisted on ; it was the corner stone of the edifice he sought to raise. Undaunted by many failures, certainly unconvinced by the arguments used to dissuade him from his purpose, Nasmith at length succeeded in obtaining the co-operation of three or four of the leading ministers in the metropolis, of different denominations. His next difficulty was to secure office-bearers for his society. He wanted two Churchmen and two Dissenters. At his house at Hoxton, on a sum-

mer evening in the year 1835, the first meeting of the London City Mission was held ; Richard Edward Dear, William Bullock, and David Nasmith constituted that meeting ; Mr. Hamilton would have been there, but lost his way in the intricacies of Hoxton. These gentlemen met several times to mature their plans, and it was with unalloyed pleasure that they hailed Sir Thomas Fowell Buxton as their treasurer. The name of this justly-celebrated man imparted dignity to the enterprise and inspired confidence. Supporters, lay and clerical, multiplied rapidly. In six months ten agents were at work, in twelve months forty, in twenty-two months sixty-three ; above £400 had been received. The object of the City Mission was that of communicating religious instruction to the poor through the medium of lay agency and household visitation ; it was originally contemplated to have three classes of missionaries, for the poor, the middling classes, and the rich. There were to be four hundred missionaries in our City, and the annual income of the society was to be swelled to £30,000.

The operations of the Institution certainly could not be too widely extended, either to meet

the metropolitan necessity, or to satisfy the desire of David Nasmith ; but this gentleman could not, would not, yield himself entirely to the interests of one society. He started a philanthropic house, a tract society, a reading-room, a young men's society, an adult school, a female mission ; and his zeal called forth censure. It was gravely argued that Mr. Nasmith was doing too much ; that he ought to be monopolized by the City Mission ; that no man, had he the strength of Samson, and the mental ability of Locke and Bacon, could profitably carry on so much diversified labour. Now, it must be remembered that Mr. Nasmith was not a paid agent. He was the gratuitous secretary of the City Mission, its benevolent founder ; the men who presumed to dictate, would never have undertaken the work at all if it had not been for the self-denying labours of this Glasgow missionary. It was a hard strait in which to be placed. He saw the object for which he had so long toiled almost realized, but threatened by the division which his extraneous movements occasioned. He saw that either he or the cause must suffer, and there was no hesitation in the choice. He resigned his connection with the

society, just as a few friends had settled upon him £200 per annum so long as he continued his services. But money was nothing to him. He never laboured for that—for so much yellow pelf. The barrel was not empty yet, nor the cruise dry!

After quitting the London City Mission, Mr. Nasmith proceeded to Cambridge, and there formed a town mission and young men's society. A Birmingham Mission was also established. Halifax, Huddersfield, Wakefield, York, were all visited, and in all of these places missionary societies were instituted. Nasmith then revisited Scotland, the total expenditure being £21 2s. 7½d.; the receipts £15 10s. 10d. But what occasioned more trouble to this modern apostle than any pecuniary difficulty of his own, was the want of funds for carrying on his plans. For his personal expenses a few friends subscribed to the "Christian Philanthropist's Fund," whereby it was hoped about £200 per annum would be realized. But the sum fell far short of that amount, and was at all times precarious. To have journeys to perform without the means of transport; bills to meet without money, funds so low, that going without dinner was an object—this was the condition of one of the best men of his time. "The

naming of £5," he writes, "was as cold water to a thirsty soul. You cannot conceive the joy I feel at the thought of being able to owe no man anything." He would start forth on a journey with a few pence in his pocket, trusting in God, not always finding trust with man.

And so David Nasmith gradually sank. He felt his own weakness, and endeavoured bravely to bear it, and considerably to hide it from those whom it must pain. His spirits were depressed, his old energy clean gone; but he steadily persevered in his work, until at last, during his stay at Guildford, he was struck for death. He was seized with violent pain while walking along the street; was removed to the house of a Mr. Percy, from thence was taken to an inn, suffering most intense and excruciating agony; and there, surrounded by strangers, he died, saying to the medical man who attended him, "Will you meet me in heaven?"

All through his life the enquiry, how to be useful, was that which he had sought to solve; and with his parting breath his anxiety still to drop the word in season was uppermost. He lived a brave life, and died like a hero—a hero of the best and highest style—as "a good soldier of Jesus Christ."

CAPTAIN CORAM AND THE FOUNDLING HOSPITAL.

At the Foundling Hospital, Guildford Street, London, there are several fine pictures, which visitors are permitted to inspect from ten to four on Mondays. These pictures serve to illustrate the condition of art in England a hundred and odd years ago. There are views of several hospitals—the Foundling and St. George's, by Richard Wilson; Chelsea and Bethlehem Hospitals, by Haytley; St. Thomas's, Christ's and Greenwich, by Wale; the Charter House, by Gainsborough. There are several Scripture pieces, chief amongst them, a famous cartoon by Raphael, a picture representing the "Slaughter of the Innocents," and described by Haydon as one of the finest instances in the world of variety of expression and beauty of composition. This picture was for some time sent by way of loan to the National Gallery. There is a picture by Casali, representing the "Offering of the Wise Men;" the altar-piece in the chapel

is painted by West, and represents Christ "Teaching Humility by a Little Child's Example;" there are some portraits of George II.; of the Earl of Macclesfield, by Wilson; of Dr. Neal, by Allan Ramsay; of the Earl of Dartmouth, by Reynolds; of Handel, by Kneller. But the most interesting pictures in the collection are those of the imitable Hogarth.

Here we have the "March of the Guards to Finchley," displaying wit and humour of no common kind. The Guards, who have turned out to oppose the advance of the Scottish rebels, are seen in Tottenham Court Road in a state of lamentable confusion and disorder, drunken, and surrounded by a horde of women; all shouting, drinking, and swearing, baggage-waggons upset, and all discipline at an end. When George II. saw this picture he was vastly indignant. "Who is this Hogarth?" said he, to a lad in-waiting. "The painter, my liege." "Bainter! I hate bainter and boetry too; neither of them ever did any good. Does the fellow mean to laugh at my Guards?" "The picture, an't please your Majesty, must undoubtedly be regarded as a burlesque." "What, a bainter burlesque a soldier!"

He deserves to be bicketed for his insolence. Take his trumpery out of my sight!" Frederick of Prussia, also a soldier, proved that he knew better what was due to genius when he received the picture as a present, and sent the artist a handsome acknowledgement.

There is another picture of Hogarth's in the Hospital, the "Finding of the Infant Moses by the Daughter of Pharaoh." But Scripture and historic composition were not in his vein; he fumed and fretted over this, and was ambitious to outshine Raffael, but the burlesque turn of his mind mixed itself with the most serious subject. In his own style he had no equal; pity he should ever have attempted to attain that which was so foreign to his nature. But he was good at portraiture, though working but seldom in that line. He could speak the truth on canvas, and the truth he always spake. Who does not remember the story of that uncommonly ugly nobleman who sat for his picture to Hogarth, and was mightily incensed because, as a Chinese artist expressed it on a similar occasion, he would "no paint ugly handsome." The peer would not accept the picture—would not pay; but

the limner sends him word that a pressing necessity for money induces him to accept the terms of Mr. Pare, the famous wild beast man, who proposes using it, with the addition of a tail, and some other appendages, as an exhibition picture! Back comes the money, with a demand for the instant sending in of the picture; the said picture to be committed to the flames.

But Hogarth could paint portraits, and paint them well. He could have painted Cromwell, who directed Lely to leave out no scar or mole, admirably; but he never would have consented to adopt the stratagem of the ancient painter, who depicted his one-eyed prince in profile. Where can a better portrait be found than that of Captain Coram, in the *Foundling*? The bronzed face of the honest seaman is instinct with life; mildly benevolent, wise and thoughtful, the good man looks from the canvas, as doubtless he looked in life. There is something about a good likeness which cannot be mistaken; there are portraits about which, without ever having seen the original, you conclude that they are faithful, that the softening of blemishes and heightening of beauties—Sir Joshua's recipe—has not been

overdone. Such is the picture of brave, lamb-hearted Captain Coram, as painted by Hogarth. "The portrait," says the painter, "I painted with the utmost pleasure, and in which I particularly wished to excel, was that of Captain Coram, for the Foundling Hospital; and if I am so wretched an artist as my enemies assert, it is somewhat strange that this, which was one of the first I painted the size of life, should have stood the test of twenty years' competition, and be generally thought the best portrait in the place, notwithstanding the first painters in the kingdom exerted all their talents to vie with it." There may in this be a little vanity on the painter's part—and whether we paint, or preach, or sing, or write, vanity is the badge of all our tribe—but there was some foundation for the vanity.

Before saying more about the original of Hogarth's pet portrait, we may be permitted to conduct the reader to the Foundling Hospital while it was yet new, and Lamb's Conduit Fields were brave with all the fashion of the time. A very gay scene is that which is presented, for the place where the Captain has erected his charity house has become a fashionable lounge for Lady Flutter

and Lord Foplington, and Dr. Drench and his lady, and Mrs. Pennyweight, the city grocer's lady, and her daughters fair. Here are they, butterflies all—*Lepidoptera*; sub-order chiefly *Rhopatocera*; diurnal in their habits, fluttering from flower to flower in the hottest sunshine; large and most magnificent species many of them, exhibiting an elegance and variety of colour unsurpassed—*Vanessa Io* and *Cynthia Cardui* very conspicuous in the busy throng. *Place aux Dames!* Observe the beauties of *Cynthia Cardui*—in common Saxon vernacular, the Painted Lady—a belle of the season, that might have stepped out of one of Hogarth's pictures; green dress of rich material, frizzled round the elbows with sixteen ruffles at the least; petticoat short, and hoop—what crino-line, “*sans flectum*,” or otherwise, can compare with it?—eight yards wide; an irresistible little apron of snowy lawn, all trimmed in knots and bows with cherry-coloured satin; a capuchin, or hood, of grey silk over the head, but not so far drawn over, nor so closely, as to hide the powdered hair and fair face of red and white set off with patches; high-heeled slippers of velvet, gold-embroidered; a stomacher of lawn, with crimson

ribbons; gloves and fan to match. There are ladies here by the score similarly dressed, driving the scented beaux half mad with love, at least so far as scented beaux can admit of such excitement. Beaux! here they are. Place, if you please, sir, Vanessa Io (painted butterfly) under inspection, and see whether he be a whit less gorgeous than the ladies. Monsieur Frisson has given him a well-frizzed wig, with a bag of the latest Paris manufacture; a grey wig it is, and sets off his powdered and painted face, patched like the ladies; his coat is a full frock, bloom-coloured, like the coat which poor Goldsmith exhibited with so much pride, as made by Filby, of Water Lane, but it is embroidered by Parisian hands with flowers and leaves a great deal more showy than nature; short satin breeches, tightly fitting to the paddings, and not reaching to the knee; cobweb silk stockings; pumps of grained leather; diamond buckles; satin vest; lace ruffles; lace frilled shirt; necktie *à la Versailles*; three-cornered hat (Egham, Staines, or Windsor); a gold-hilted sword, with which one thinks of transfixing said butterfly while under examination, adding him so impaled to an entomologist's col-

lection. Let us not forget his gold repeater, by Graham ; nor his handkerchief saturated with musk. Sure the dandy was made to match the bevy of beauties by which he is surrounded ; all are of the world of fashion, dwelling in rose-coloured boudoirs, looking at nature from a convenient distance, and quite ignorant of hard work, or hard fare, or hard fortune, their thread of life spun of the softest and whitest wool ; what know these splendid *Rhopatocera* of caterpillars feeding upon nettles !

Yet flirting, promenading, lisping, laughing as lightly and genteelly as gentlefolks can laugh, they might know something of this by reason of the very hospital beneath whose walls they walk. They might an' they would, see the poor grovelling caterpillars, toiling and dying, of a destructive race, with no beauty to commend them, of voracious larvæ, and the rest of it ; but they have come to learn no such lessons. How warm the air is ! How balmy the breath of spring ! How delightful to be a shepherd or a shepherdess—after the Dresden china pattern—and tend with silver crocks the gentle little bleaters in Lamb's Conduit Fields ! There is Hogarth ; there is Wilson,

prince of English landscape painters ; there is Rysbrach the sculptor ; there is that man of genuine taste in coloured lamps and in temples, Hayman, embellisher of Vauxhall Gardens ; and there are ever so many more grand celebrities. Surely it is a delightful thing to lounge here in the sunlight, " For life, my dear Lady Fanshawe, whatever our moralists may opine to the contrary, is really after all not so unbearable ; nay, quite endurable, I assure you. My wants are few, my tastes simple. Give me my valet and my chocolate, my wardrobe, sedan, a little society, and I am content to live ! "

Imagine old Captain Coram standing amid the crowd that fluttered round his noble institution ; imagine him revealing what he has seen, speaking not in the fashionable *patois* of the west, but in the plain English of a sailor. How rapidly the butterflies would flutter from him, for his story would be shocking to their delicate and refined habit of thought, and would smell horribly of rum, bilge-water, and tobacco smoke !

This old captain was born at Lyme Regis in the early part of the reign of Charles II. He was christened by the name of Thomas, and was

bred to the sea. What little there is known of his early life shows that his lot was not exempt from toils and trials. The condition of a boy at sea is not enviable ; skippers are not usually soft-hearted nor light-handed, and there is amongst most of them even now a supposition, still more strongly advocated and espoused two-centuries ago, that the way to teach a boy his duty is to kick and cuff it into him, with a few admonitory taps on the head with a belaying pin. Of course poor Tom Coram had to learn these lessons, but he did not, as some boys have done, run away from his ship when the ship touched shore, nor maliciously leap over the gunwale and drown himself, to escape the rope's end wielded by the hand of an intoxicated mate. He bore whatever hardships he had to undergo with a brave heart, having within him a sense of duty and a buoyancy of spirit not to be shaken or depressed, and so in the course of time he rose to honour in his profession, and was dubbed Captain, being the master of a vessel trading to the colonies.

In the year 1719, Captain Coram was sailing in the good ship "Sea flower." "Ships are





NASMYTH ARRESTED AS A SPY.—*Page 97*

but boards, sailors are but men, and there be land rats and water rats; I mean pirates." So argues old Shylock when debating with himself the proposition of Merchant Antonio "to do a little bill." Captain Coram, if he had ever doubted about this had reason to convince him of its truth on this voyage, for the good ship, so taut and trim, ran aground off Cuxhaven, Northern Germany, and could not by the best of seamanship be got off again. Now Cuxhaven, though a different place then to what it is now—the favourite resort of bathers—was not supposed to be utterly barbarous, and great was the astonishment of Captain Coram and his companions when they saw the fellows in the boats which they supposed were put off for their rescue, climbing their bulwarks, marline-spike in hand, threatening in unintelligible German, but more intelligible gestures, the direst vengeance on any one who should venture to interfere with their proceedings. They dived into the hold, ransacked every cabin, brought up on the deck trunks, bales, boxes, coolly emptied out their contents, and "looted," to use an Indian phrase, the best and most portable articles. Women shrieked,

fainted, or implored, men protested, and strove to regain their property. Captain Coram denounced the Cuxhaven folk as the most barbarous of savages, but all to no purpose. The ship was plundered. Coram always entertained a vivid recollection of that outrage.

Residing when at home in the east of London, Captain Coram became familiar with a population singularly unlike the butterflies of the west, in outward aspect at all events. A rude, rough, riotous class ; Jews and Gentiles, harmoniously working together to rob poor Jack ashore of all his pay ; crimps setting traps for seamen or landsmen, when sailors were in request ; tramps from east and west, and north and south, clustering together in putrid hovels, consorting for the deceiving of simple-hearted folks, by the detailing of imaginary afflictions, and the story of griefs that had not yet been borne ; low tavern keepers, of the vilest class, charging quadrupled prices for food and drink of the worst ; and seamen of all sorts, all countries, all conditions, spending freely, drinking freely—living as if there were no to-morrow, much less a day after to-morrow also. To all these there was added destitution ; pining,

patient want with bony hands labouring to find bread for hungry progeny ; poor labourers looking eagerly for work, no matter how hard, that they might eat bread, no matter how coarse. Women, thin, worn, wretched, in "unwomanly rags," toiling early and late, and subject to brutal violence from the men who had sworn to love and cherish them ; women who looked wistfully through churchyard railings, and haply thought how blessed were the dead ! And there were children, learning the lessons of the streets in the hard school of poverty, rollicking in the mud, and sharpening their wits on the pebble stones to a keenness of edge which street stones only can impart. Worst of all, there were infant children frequently exposed to die or live as chance might dictate. These poor little ones, whose utter helplessness was their most eloquent appeal, found a friend in bluff old Captain Coram. He did not stop to enquire by whom these children had been deserted, nor for what cause—sin, sorrow, suffering, "weird throe ;" he never stayed to question ; enough that the parental heart had lost its love—that an infant was exposed to die ; to rescue it from peril, to take it up tenderly as a shepherd

would take up a stray lamb that had wandered, was Captain Coram's method. These children, found in the street, these foundlings, were in sore need of a friend, and they met with the best of friends in the old sea captain.

Other people might do as they would, priest and Levite might pass by on the other side, as for this sea captain, he was for helping the helpless, and giving shelter to the innocents cast out to die. There were not wanting those who denounced him as a meddler with what did not concern him, and there were probably those in the old time who regarded the Samaritan as interfering with what was not directly within his sphere. Why should he concern himself with the wounded man, what was the sufferer to him or he to the sufferer; the *elite* of the world passed by, and gave no help; was it not presumption on his part, a covert rebuke, to take active measures where men of dignity and station remained passive. I suppose the Samaritan was very heedless to comment; certainly Captain Coram was—he felt that he had duty to perform, and he did his work bravely. He formed the idea of erecting a hospital for the reception of outcast children, and endeavoured

enlist the sympathies of wise and wealthy people in his exertions. The captain thought, and not unjustly, that the forlorn condition of children cast out to die would commend itself to the tender hearts of the ladies. Of all the lovely and interesting traits which distinguish woman, none stand out in more striking or beautiful relief than the affectionate solicitude with which they tend the helpless years of infancy. Christianity has honoured, directed, and elevated these natural emotions of a woman's heart, and to dedicate her children to the Lord while they are still fondled on her knee, is the Christian mother's privilege and delight. So Captain Coram appealed to the women of Christian England, and many of them responded to his generous appeal. But not all. Everybody knows that a great name is a great attraction ; do we not head our subscription lists with the titled names of aristocracy, not so much for the sums given as for the sake of their example, that ~~pledges~~ ^{will} ~~exceed~~ ^{exceed} themselves after a peerage pattern ? Let us be anxious to obtain the name of the Princess Amelia, as a lady-patroness, and be accordingly waiting upon her Royal Highness one fine morning, but instead

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of being introduced to her august presence, was encountered by Lady Isabella Finch, woman of the bed-chamber, who bid him in no measured terms take himself off, and his petition with him !

Many discouragements of this sort had Coram to encounter, but what cared he for difficulty ? He had resolved to carry on the work, and not all the ladies-in-waiting on all the princesses in Europe could turn him from his purpose ! Royal help he was determined to have, and he obtained it. Princes, peers, peeresses, wealthy people from the east as well as the west, gathered round him ; painters, architects, missionaries, sculptors, men of letters, all willing to aid the captain, but their help was not obtained without much hard toil. Coram worked at his favourite scheme for seventeen years. There is an old proverb which tell us we should dread the man of one book ; there is a popular impression that a one-idea'd man is a bore ; but such-men are always useful ; a man like Howard, who devotes his life to the improvement of prisons and prison discipline ; a man like Wilberforce, whose whole soul is wrapped up in the Anti-Slavery Question ; a man like Coram,

spending his life in tender care for outcast children—such men the world could not spare. So Coram had at length the happiness of knowing that his scheme was so far perfected that publicity might be given to it; that a refuge for destitute children was really established, and we may imagine with what a thankful spirit he penned the lines which set forth the opening of the Institution, and saw them duly printed in the morning newspaper.

The first admission of children took place in 1741, under the following advertisement:—"Tomorrow at eight o'clock in the evening, this house will be opened for the reception of twenty children under the following regulations. No child exceeding the age of two months will be taken in, nor such as have the evil, leprosy, or disease of the like nature, whereby the health of the other children may be endangered; for the discovery whereof every child is to be inspected as soon as it is brought, and the person who brings it to come in at the outer door, and ring a bell at the inward door, and not go away until the child is returned, or notice given of its reception; but no question will be asked of any person who

brings a child, nor shall any servant of the house presume to endeavour to discover who such person is on pain of being discharged. All persons who bring children are requested to affix on each child some particular writing or other distinguishing mark or token, so that the children may be known hereafter if necessary."

The applications were numerous. Women eagerly brought their children, and whenever the advertisement was repeated, it infallibly drew crowds around the door of the Asylum. But this led to mischief. Serious disturbances took place; the women struggled and fought to get near the entrance, so as to be first in obtaining admission, and the affrays were fatal in some cases to the children brought. There is somewhere a picture of Hogarth's, representing the "Pool of Bethesda," that pool, the waters of which were at intervals endowed with miraculous powers for the cure of all diseases. He has represented a busy crowd, all anxious to be foremost, the servants of a wealthy but afflicted lady are driving back a poor cripple who is just stepping into the water; this scene of riot and tumult may possibly have been suggested by the scene

outside the hospital doors on a reception morning, for Hogarth was often there.

A better plan of admission—a plan which promised to avoid the scandal of a public riot—was adopted soon after the opening of the institution. The women were admitted to the court-yard, and seated on forms. Bags filled with balls were then brought round by the attendants. Those women who drew a white ball were sent in at once, so that the children might be examined, and if sound, admitted. Those women who drew black balls were at once expelled; those who drew red balls were permitted to remain, in case any of the white-ball children should be rejected, when the number would be made up from the red-ball section. This plan worked better, but it was open to a grave objection in the mind of the founder; it shut out many cases, as indeed all plans must, which admitted of any restriction at all. It grieved his heart to think of those who were turned away, and he pondered deeply on what remedial measures could be introduced. The average number of children admitted annually to the hospital was ninety-two. Some of these were kept in the house, where nurses were

engaged to attend them ; others were sent into various parts of the country to be taken care of by peasant women, looked after by ladies interested in the work. Mrs. Hogarth, Sir James Thornhill's daughter, took an active share in this part of the business.

On the 29th of March, 1741, there was a great public christening of "nobody's children," as they used to be called, in the chapel. This ceremony was attended by many illustrious persons, and peers and peeresses stood sponsors, and gave their own names to their godchildren. The names given to the children in the hospital was a source of anxiety as their number increased and multiplied. They were called by the names of all the peerage, all the famous men of ancient and of modern times ; all sorts of trades, and titles of distinction ; all kinds of things animate and inanimate, all sorts of words and phrases adopted as proper names, until the christening of Kitty Finis, which put an end to these nominative vagaries.

It may not be uninteresting to notice the common variety of articles which were sent in with the children as tokens by which they might,

if necessary, be subsequently identified. Among these may be noticed a half-crown of the reign of Queen Anne with hair ; an old silk purse ; a lottery ticket ; a silver groat of William and Mary, and a shilling of the time of James II. ; a silver groat and an ivory fish ; a stone cross set in silver ; a small gold locket. Sometimes the registrar was very brief in his description of the tokens sent, thus there is an entry of a child with "a paper on its breast and a clout over the head." Sometimes there were lines of poetry : of these we may furnish two examples :—

"Go, gentle babe, thy future life be spent
In virtuous purity and calm content ;
Life's sunshine bless thee, and no anxious care
Sit on thy brow, nor draw the falling tear ;
Thy country's grateful servant may'st thou prove,
And all thy life be happiness and love."

Here is another sample—

"Pray use me well, and you shall find
My father will not prove unkind,
Unto that nurse who's my protector,
Because he is a benefactor."

Sometimes there was nothing at all by which the child might be recognized, except by the fact

of there being nothing. There is the instance of one of the Foundling children becoming exceedingly wealthy, and very anxious to ascertain his parentage. All the information he could obtain at the Hospital was that he was found in the basket *naked*!

Captain Coram was perhaps the only man in England who could have successfully established an institution such as the Foundling Hospital. But he was well known, and had done good service. Much of his early life had been spent in the Colonies, and Horace Walpole fairly said of him, he was "the honestest, the most disinterested, and the most knowing person about the plantations." Holding an estate near Taunton, Massachusetts, he presented fifty-nine acres of land towards the erection of a church, school, home, etc., which he had the satisfaction of seeing built. A very handsome edition of the Book of Common Prayer was presented to Coram for use in this church by the Speaker of the House of Commons. At his suggestion also, and by his assiduous labours, an Act of Parliament was obtained whereby the settlers in the American Colonies were permitted to manufacture tar, a

privilege which had been hitherto denied them. Previous to this time all the tar consumed in the British navy was imported from Sweden; the adoption of Coram's suggestion brought employment to thousands of people, and saved a million of money to the nation. Thus we find this good man continually occupied in real, hearty, honest benevolence—a self-denying man who was willing cheerfully to sacrifice his own interests for the benefit of others, and whose virtuous soul despised a mean action. The government did well when it appointed him one of the trustees for the Georgian Settlements in America. His wise counsels brought gain to the treasury and profit to the Colony, and no man was more respected nor deserved more respect than he. One of his schemes was that of procuring a bounty on all naval stores imported from the Colonies, a scheme which gave an immense impetus to the Colonial trade. One of his last efforts to do good in America, was a scheme for uniting the interests of the North-American Indians more closely to the British, by the establishment of native schools. The largest part of this man's life was spent in serving the public, and that with so total a disregard for his

own private interests, that towards the latter part of it he was himself supported by voluntary contributions, subscribed by public-spirited persons, at the head of whom was Frederick, Prince of Wales, father of King George III.

When Dr. Brocklesby asked Coram whether he would be offended at a subscription being made for him, he nobly answered, "I have not wasted the little wealth of which I was formerly possessed in self-indulgence or vain expense, and I am not ashamed to confess that in my old age I am poor."

Poor! are such men ever to be accounted poor? Are they not rich with treasure "that neither moth nor rust doth corrupt, which thieves cannot break through and steal?" Poor! what saith the wise man? "There is that scattereth and yet increaseth, and there is that withholdeth more than is meet, but it tendeth to poverty. The liberal soul shall be made fat, and he that watereth shall be watered also himself." Poor! such poverty is worth a life-time's labour; it brings with it a recompense such as no hoard of wealth can secure. Such poor men shall find ready access at the pearly gates of the Golden City,

when Croesus stands aghast, even as the laden camel at the needle's eye.

Coram died at his lodgings in Leicester Square, on the 29th of March, 1751, the tenth anniversary of the great christening in the Foundling Hospital. He was interred in the vault under the chapel, where an ample inscription perpetuates his memory — a memory which was abler endorsed on the living tablet of many a heart. A special service was performed in honour of this good man whom God had taken to Himself, and whose dust was to rest in hope within the building he had founded, until the last trumpet's blast shall waken the dead to the dread assize.

“The ship sailed smoothly o'er the sea,
By gentle breezes fanned,
When Coram, musing at the helm,
This happy fabric planned.
Not in the schools by sages taught,
To woo fair Virtue's form ;
But nursed in danger's flinty lap,
And tutored by the storm.

“When thinking, tempests round him raged,
And swelling billows heav'd,
The bark a wretched orphan seemed,
Of aid and hope bereaved ;

If through the clouds a golden gleam
Broke sweetly from above,
He blessed the smiling emblem there
Of charity and love.

“ Around the glowing land he spread
Warm pity’s magic spell,
And tender bosoms learned from him
With softer sighs to swell.
Beauty, and wealth, and wit, and power,
The various aid combined,
And angels smiled upon the work
That Coram had designed.”

Both during the life-time of the founder and after his death the Foundling Hospital was extremely popular. It was taken under the patronage of Parliament, and thrown open for the reception of all infant children that might be presented, without distinction or question. A basket was suspended outside; and, on one night, June 2, 1756, *one hundred and seventeen* children were handed over to the fostering care of the State. In the first year of this indiscriminate admission 3296 children were taken in; in the second year 4085; in the third year 4229; in the tenth months of the fourth and last year, 3324; in all 14,934. This could not be permitted to continue; it was well known that every

undue advantage was taken of the institution. Parish authorities relieved themselves of the burden of young children, by sending them strait-way to the Foundling ; they were brought up by carriers from all parts of the country at stated charges, which fluctuated as competition increased. Many of the poor infants thus exposed perished before they reached their destination. Of five brought up by one person, three died on the road ; of eight brought by another, seven perished by the way. It was asserted that some of the carriers took the money, and cast out the children to die in the hedge. Ignorant, vicious, and indigent people were glad enough to avail themselves of thus readily providing for their offspring, and nobody's children, it was predicted by writers and speakers on the subject, being, as it were, aliens in the land, might presently rise up, like the slaves of ancient Rome, and throw the whole kingdom into confusion.

One of the most melancholy features of this influx of deserted children was the want of proper provision for their reception ; in consequence of which the mortality amongst them rose to 70 per cent. ; out of the 14,934 admitted during the

three years and ten months, only 4400 lived to be apprenticed. After costing the country upwards of £500,000, the Parliamentary grants were withdrawn from the hospital, and it has since, under consistent and appropriate regulations, been supported by voluntary contributions.

Among the bequests left to the institution, the following are probably the most curious. One Shirley, of Essex, bequeathed to the governors and trustees *nine tragedies and one comedy*, which he had in vain sought to get upon the stage, and to the profits arising from the sale of which, supposing any Manager could be induced to take them, said governor and trustees were heartily welcome. William Williams bequeathed to the trustees all his property in Jamaica, to sell the same, "together with all and every negro and mulatto on the plantation;" one shilling, however, was to be handed over to Gersham William, son of the testator, to buy him a hempen halter, which he "richly deserved!"

Handel was a liberal and firm friend to this Hospital. Every year he had performed, under his own immediate direction, his sacred oratorio of the "Messiah" in the Foundling Chapel. In

consequence of these performances, the benefactions to the Charity from 1747 to 1777 amounted to £10,290. Handel also presented an organ to the chapel, and bequeathed as a legacy to the Hospital a fair copy of the original score of the *Messiah*. Hogarth and other artists, as we have seen, were generous donors to the Foundling, which was thus much indebted to the sister arts, music and painting. And never are the arts seen to so much advantage as when ministering at the altar of charity—white-robed vestals offering solemn service to Him who came, “not to be ministered to, but to minister.” Blessed charity! It is seen in this our London city in many a varied, many a beautiful form; eyes to the blind; feet to the lame; giving from its store to clothe the naked and to feed the hungry, to raise the fallen and to save the lost, to bind up broken hearts, to smooth the pillow of the sufferer, to wipe the mourner’s tears; but nowhere more gracefully is this sweet office exercised than in its care for children. In its tender care for the lambs of the flock it shines out with a Divine lustre,—the brightest jewel in the ephod of the Church’s vestments. One is forcibly re-

minded of this as in the chapel of the Foundling Hospital the voices of the children are heard chanting the solemn psalms or singing the grand old anthems that breathe forth trust and confidence in Him whose word is steadfast, and of whom the inspired bard has declared: "When thy father and thy mother forsake thee, then the Lord shall take thee up."

HENRY MARTYN :

THE CHURCH MISSIONARY.

THE Church Missionary Society was established in the year 1800, under the title of the "Church Missionary Society for Africa and the East." At its commencement it was limited in its operations. Its annual income amounted to little more than three hundred pounds; there was apathy at home and opposition abroad, and the men who undertook to go forth to preach the gospel to the heathen, actually went with their lives in their hands.

The most eminent of these early pioneers of Christianity was the famous Henry Martyn, better known as *the Church Missionary*.

Henry Martyn was born on the 18th of February, 1781, at Truro, in Cornwall. His father had originally been a labourer in the mines, but being a studious and persevering man, he had risen to be chief clerk in a mercantile office

and lived in easy circumstances, the happy father of good and clever children. Henry, the subject of our sketch, was a very delicate child, unfitted for rough sports, and so sensitively acute as to be pained by a harsh word or a thoughtless jest. Not the sort of boy, you might imagine, who had the materials of a great man in him, but a tender plant that required careful watching, and upon which no rough wind must be allowed to blow. But the child was very cheerful and desparately idle, full of quiet fun and harmless roguery, and sharp too ; so ready that he mastered his tasks easily enough if, as we say, he chose to give his mind to them. Such a boy with his quick wit, might become a shrewd man ; might in the long run be beaten by blunter, duller fellows, even as the hare was beaten by the tortoise. His father was very anxious about him, and as he was universally beloved, so every one was ready to lend him a helping hand. At the Truro Grammar School, one of the senior boys used to sit next to him to keep him steady at his lessons, and of this lad Henry always entertained an affectionate remembrance. He helped him over many a difficulty ; not in his lessons, for these he readily

overcame, but with his schoolfellows; stood by him when anything went wrong, rescued him from violence, screened him from punishment; an excellent good friend, whom Henry sorely missed when left to his own resources. What could he do then but take care of himself, and his idea of doing so was resenting every offence, and yielding to his own passions without regard to consequences. His natural irritability, increased by this indulgence, led him on one occasion to hurl a pocket knife at a schoolfellow, which luckily missed its aim.

The passionate boy was reminded, as the knife thrown from his hand still quivered in the wall, that if he gave way to his temper to this dangerous extent, he might one day be hanged for murder. This expression made him thoughtful; he saw that he was the slave of his own passions, and resolved to be their master. He studied hard, avoiding every occasion of quarrel, and progressed rapidly. When just turned fourteen he applied for a vacant scholarship at Oxford. He went to the University alone, and acquitted himself so well, that in the opinion of many he ought to have been successful. Successful, how-

ever, he was not, and for this failure he afterwards expressed the deepest gratitude. Success at that time might have been his ruin.

Unsuccessful at Oxford, young Martyn turned his thoughts to Cambridge. There he was resolved to contend for honours; he had to wait for an opportunity, and amused his leisure with shooting, and reading Chesterfield's letters. At length the opportunity came, and he was duly entered, and commenced a laborious and patient course of study. He was determined to succeed, resolved to stand first, a laudable ambition, though he was afterwards led to regard it as insignificant. His mind was not at that period strongly imbued with religious truth, and even the sound of the gospel, he says, was grating to his ears. That for which he strove, he gained; he became first in his college, and pleased his father "prodigiously." Alas! for him, that father was soon taken from him, and he was overwhelmed with sorrow.

In the deep grief which fell upon him at the loss of a parent so tenderly beloved, Henry Martyn sought consolation in religion. He was then urged by an old schoolfellow to read the Bible, and

he "began with the Acts of the Apostles, as being the most amusing." But reading that first missionary Report, that record of heroic self-devotion, his heart was deeply affected. We may imagine the youthful student, his spirit wounded by recent bereavement, the world new and strange to him, life just begun, perusing the strange story of the early Christians ; how they gave their all—homes, lands, treasures, everything to make common cause ; how they bravely preached and prayed, undaunted by the frown of power, undismayed by the threat of punishment. How his heart must have throbbed as he read the Apostle's record of his sufferings for the cause of Christ, "in stripes above measure, in prisons more frequent, in deaths oft. Of the Jews five times received I forty stripes save one ; thrice was I beaten with rods ; once was I stoned ; thrice I suffered shipwreck, a night and a day I have been in the deep ; in journeyings often, in perils of waters, in perils of robbers, in perils by mine own countrymen, in perils by the heathen, in perils in the city, in perils in the wilderness, in perils in the sea, in perils among false brethren ; in weariness and painfulness, in watchings often, in

hunger and thirst, in fastings often, in cold and nakedness." Imagine young Henry Martyn reading these words, and feeling as though something spiritual swept over the chords of his heart, and called forth responsive music to the magnificent harmony of St. Paul. He resolved that the object of God's glory should henceforth be maintained by him as "his opinion." He had learned to admire, not yet to emulate the heroism of Christian devotion.

Again he devoted himself to study, and laboured with so much success that at the age of twenty he was senior wrangler in his college. But he was not content! Like the fabled apples of the Dead Sea shore, the fruits of his exertion seemed to turn to dust and ashes in his grasp. He yearned for something higher and nobler than the University could bestow; he was weary of the shade of academic bowers; he had eaten of the tree of knowledge, oh! that he might put forth his hand and take of the tree of life. He sought the help of the Mightiest, and henceforth lived a new life. His resolution was to enter the church, and was elected a Fellow of St. John's. His leisure hours were employed in literary pur-

suits, and he obtained the first prize for the best Latin composition. He was successful in all he undertook; powerful and persuasive as a preacher, energetic and devoted in pastoral duty.

Successful in all things, he yearned to be still more successful in the work of the ministry than he could hope to be in England: there he "might build on another man's foundation;" he wanted new ground; to go forth in obedience to the marching order of the Great Captain, to "preach the Gospel to every creature." He had heard of the successes of Carey the Missionary, his trials and toils; he desired to emulate his zeal. The Church Missionary Society had just then been formed; Henry Martyn became its staunchest champion, first defender, first hero, first saint and martyr. "What have I to do now," he cried, "but to labour and pray, and fast, and watch for the salvation of my own soul and those of the heathen world? Oh, gladly shall this base blood be shed, every drop of it, if India can but be benefitted in one of her children!"

Waiting for the opportunity to offer for him to visit India, he began to examine himself watchfully, and to correct those habits which he con-

sidered evil in their nature. He says:—"A despicable indulgence of lying in bed gave me such a view of the softness of my character, that I resolved, on my knees, to lead a life of more self-denial. The tone and vigour of my mind rose rapidly. All those duties from which I usually shrank seemed recreations. I collected all the passages from the Gospels which had any reference to this subject. It is one which I used to preach to myself, and mean to preach to others."

At length an opportunity offered which enabled him to enter on missionary work. He was appointed Chaplain of the East India Company, and then the sharpness of the pain he had to endure began to be experienced. He was devotedly attached to a young lady from whom he was separated for ever in this world. How deeply he loved her, and how fondly he was loved in return appears from his diary, but from some mysterious reason she was not permitted to accompany him in his missionary work; he went forth alone, uncheered by social sympathy. Not without a struggle, not without a hard struggle, an "uncertain pain" which he knew "would increase to great violence." A hard, terrible struggle to tear himself away

from everything he loved ; feeling as if he had suddenly been told that every friend in the world was dead. He sailed with the fleet ; but the fleet was detained in Falmouth, and he took the opportunity of revisiting his friends, only to undergo the bitterness of another parting. He was called away suddenly. The event has been thus described :—

“ At nine in the morning I was sitting at ease with the person dearest to me upon earth, intending to visit some persons with her, and preach on the morrow. Four hours only elapsed, and I was under sail from England.” Yet the torture of this sensitive mind was still prolonged. The tossing ship, combating with adverse waves, could not lose sight of land ; and thus, hour after hour, he saw the trees, and rocks, and headlands of his early home crowding upon him—images of former happiness which he now forsook for ever. At last, however, they disappeared—the fearful temptation was over. Martyn gently set down the cup of sorrow from which he had drained the dregs, and turned to his work, saying, “ Farewell, perishing world ! ‘ For me to live is Christ.’ I have nothing to do here but to labour as a stranger ;

and by secret prayer, and outward exertion, do as much as possible for the Church of God and my own soul, till my eyes close in death, and my soul wings its way to a brighter world."

His first business was to thoroughly master Hindostanee, and he toiled assiduously at the work. But he was not unmindful of his character as a Christian missionary among those whom he describes as the "baptised heathen." He preached frequently and boldly. He heard that the officers declared that they would not attend if he preached so terribly of future punishment, and on hearing this he chose for his text, "The wicked shall be turned into hell," and pushed home the dread matter with exceeding force. To officers and men the mission of the young clergyman seemed absurd; the idea of converting the Hindoos had never entered their minds, and when presented to them by Henry Martyn, they could see nothing but its utter impossibility. The voyage was long, occupying nine months or more; they touched at Madeira, and, after being nearly shipwrecked, anchored at St. Salvador. There Martyn became very intimate with a Portuguese gentleman, and became his frequent guest; he also held many

interesting conversations with the Catholic clergy, who admired his excellent Latin, if they did not relish his creed. At the Cape of Good Hope, when the soldiers on board were engaged in action, Martyn busied himself in spiritual attention to the wounded and dying, and nearly lost his life by a gun-shot fired at him by a drunken trooper.

At length he reached India, the scene of his labours, and seized every opportunity of declaring the "Good news" from heaven. The English residents, generally, regarded him as an enthusiast; the native women and children fled from him in terror; the men were more willing to listen and to argue, and altogether he found the work very different from what he had expected; but he felt "impregnable to any discouragement," for still he said "how easy for God to do it! It shall be done in good time; and even if I should never see a native converted, God may design by my patience and continuance in the work, to encourage future missionaries."

A recent writer, speaking of the missionary's condition at that time, says:—

"At Dinapore there were many English, but this was all the worse for Henry Martyn. Not

only was he grieved by the neglect and levity of his countrymen, but he was pained to see how he himself was regarded by the natives as an unjust intruder, being an Englishman. He noticed the glances of hatred and contempt which were cast at him when he went abroad in his palanquin, by those who could not discern his heart full of love. He would fain have proved himself of a different spirit from the rest, by going about doing good ; but not only were his instructions to the military restricted, his method of preaching dictated to him with most unbecoming irreverence, and certain bitter invectives, which had been published against him in Calcutta, circulated here also—these were not enough ; every attempt he made to do good amongst the natives was regarded by these sordid souls with a mixture of jealousy and fear. As for the natives themselves, subject at this time to much oppression and wrong from England's power, it is not so much to be wondered at that they should regard Mr. Martyn's efforts with suspicion. But we must admire the moral bravery of the man who, though he "felt every native thought him his enemy," resolved on going abroad without his palanquin, that he

might hold conversations with them; and thus religious discussions soon became of daily occurrence, more especially with his Moonshoo and Pundit, whom he in vain endeavoured to convince."

During his residence at Dinapore, Henry Martyn prosecuted incessantly the study of Sanscrit and of the Baharre; for Hindostance, which he had so diligently accomplished, he found was not current in Bahar, and of the Baharree there were many dialects. To these employments in the commencement of 1807 he added the translation into Hindostance of the Book of Common Prayer. He shortly afterwards commenced the performance of divine worship in the vernacular language of India, and concluded with vigour a translation of the New Testament. In 1809 he was removed from Dinapore to Cawnpore, where he remained some months, until ill health compelled him to return to Calcutta. He next resolved to make a voyage to Persia to collect the opinions of learned natives on the Persian translation of the New Testament which had been executed under his inspection, and which had been twice returned for revision. At Shiraz the best Persian

had been spoken for centuries, and there also was to be found a college, and, of course, their largest number of literati.

Weak as Henry Martyn was in bodily health, he resolved on this expedition, and landed at Bushire early in May, 1811. The most difficult part of the journey had then to be performed on horseback under a burning sun. "When," says he, "the thermometer was above 112°, fever heat, I began to lose my strength fast; at last it became quite intolerable. I wrapped myself up in a blanket, and all the warm covering which I could get, to defend myself from the external air, by which means the moisture was kept a little longer upon the body, and not so speedily evaporated as when the skin was exposed. * * The thermometer at last stood at 126°, and I concluded that death was inevitable."

On the 9th of June, however, Mr. Martyn reached Shiraz, and was entertained by a Mahomedan of rank, Jaffier Ali Khan. By the assistance of the brother of his host he was convinced of the inaccuracy of the translation, and immediately commenced a new one. His mission becoming generally known, excited considerable



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interest. Controversy ran high, and bigoted Moolahs and renegade Jews would have made short work of him if they could. An Arabic defence of Mahomedanism was issued by the preceptor of all the Moolahs, and Mr. Martyn was daily challenged to argue the truth of his creed.

Towards the end of November, notwithstanding the many interruptions which he experienced, great progress had been made in the Persian translation of the New Testament, and Mr. Martyn ordered two splendid copies of it to be prepared, designing to present one to the King of Persia and the other to his son. This project, however, was never accomplished. When the work was finished, Mr. Martyn, having obtained letters of introduction, started for Carach, in order to obtain an interview with the prime minister, but there he was grossly insulted by the servants, and informed that the king would see no one unless presented or accredited by the ambassador. It was suggested that he might obtain an audience at Sultanich, and thither he went, but without success. Severe illness attacked the missionary—fever set in—the translation completed was handed over to Sir G. Ousley and his

lady, and the former promised himself to present the books to the King. As for poor Martyn he was sinking rapidly. He was hurried forward on his journey when ill able to travel, when both fever and ague were upon him; he could obtain no respite, and at length, after the most dreadful sufferings, he "fell asleep" at Tocat. A young man still, with brilliant powers, indomitable energy, and heroic devotion—a pattern missionary, who "fought a good fight," and left behind him, the best of all legacies to posterity—a glorious example.

DR. SCORESBY:

THE SAILOR-CLERGYMAN.

ON a March morning, in the year 1857, the town of Torquay, presented a very singular and mournful aspect. There was a hushed stillness, broken only by the splash of the sad sea wave and deep tones of the death-bells. Windows were closed, flags half-mast high, the people scattered here and there in groups, clothed in mourning; and thus surrounded by every token of sincere regret, the body of a worthy man was borne to its last home: "Earth to earth, dust to dust, ashes to ashes!"

Most people know Torquay, the English "Montpelier;" its three tiers of buildings facing the sea, rows of trees fringing the lower tier, the middle tier of handsome terraces of stone; the topmost of elegant villas, all sheltered by the Braddom, by Park Hill and Walden Hill covered with pines. The myrtle, the aloe, the orange-tree, the citron, hydrangea, and rhododendron

add their exquisite beauty to the scene, and their sweet perfume to the warm air—the emerald grass, the golden belt of sand, the luxuriant foliage, the bold headlands, the sea like a lake of molten silver, the sky of intense blue,—who that has once gazed on Torquay can ever forget its beauty? But over that beauty there was the shadow of deepest gloom on the March morning of which we speak—death had taken away one who had endeared himself, by a life of Christian charity to all who knew him; one whose scientific attainments had made his name familiar all over the world, and whose religious zeal and unaffected piety has ensured for that name something far better than earthly immortality. It was a solemn scene, this scene in Upton Church, as the words were read which told how the corruptible should put on incorruption, the mortal immortality; how death should lose his sting, and the grave be spoiled of its victory. And so they lowered him into “the house appointed for all living,” and with voices broken by sobs, uttered the “Amen” to the thanks which were offered that the dear brother had been taken out of the miseries of this sinful world.

A monument, raised by subscription, testifies to the esteem in which he was held who was buried on that March morning. It is a monument of Gothic design ; and is placed on the north side of the nave of Upton Church. In a panel on the base are grouped an open Bible, a ship and anchor, a mariner's compass and other mathematical instruments, and on a tablet of pure statuary marble is engraved the following inscription :—

In Memory of

THE REV. WILLIAM SCORESBY, D.D., F.R.S.,

MEMBER OF THE INSTITUTE OF FRANCE,

AND OF VARIOUS OTHER SCIENTIFIC INSTITUTIONS

IN EUROPE AND AMERICA ;

IN EARLY LIFE A DISTINGUISHED SEAMAN,

REKNOWNED FOR HIS DISCOVERIES IN THE ARCTIC REGIONS ;

AFTERWARDS VICAR OF BRADFORD,

AND LATTERLY

HONORARY LECTURER OF THIS CHURCH.

PIOUS, BENEVOLENT, DEVOTED TO SCIENCE,

OF SURPASSING ENERGY,

HIS FRIENDS AND ADMIREES,

IN GRATEFUL RECOLLECTION OF HIS PUBLIC SERVICES,

AND AS A TESTIMONY OF THEIR REGARD FOR HIS PRIVATE

WORTH,

HAVE ERECTED THIS MONUMENT.

BORN AT CROPTON, NEAR WHITBY, A.D. 1789,

DIED AT TORQUAY, MARON, 21ST, 1857.

And this is the brief outline of this great man's life. It would be well for our race, if tombstones ever had life stories of equal worth to tell, and told them as honestly and plainly. The open Bible, the ship, the compass, the mathematical instruments, picture the man's life and instincts—a sailor clergyman. No trained preacher of the schools, sitting from youth upwards at the feet of some modern Gamaliel, but a weather-beaten seaman, many years occupied in the Greenland whale fishery, until called away by Him who chose fishermen for his first disciples, and sent them forth as "fishers of men."

Very full of interest is this life of Scoresby. His father was engaged in the Greenland fishery, and the boy's strongest inclinations were towards a sea-faring life. To tread the deck of a good ship, with a good wind blowing, and the canvass spread, to ride over the pathless sea, and bid farewell to the rocky shore where the waves broke in yeasty foam; to gaze on the wide ocean, on the floating citadels of ice; to sail amid the splendours and the terrors of stern winter's stronghold; to chase the whale, the seal, the walrus—all this he often pictured to himself as his future lot; a happy

lot he thought it, one which would give scope for dashing enterprise. But from his earliest years there was in his heart a strong religious tendency —his mother's prayers and teachings made him thoughtful, very regardful of the Sabbath, scrupulously conscientious. He was really astonished that anyone should utter wilful falsehoods; he would not pick up any article of value that he might see in his path on the Sabbath, and when once induced to take a six-bladed knife for which no owner could be found, his mind was so affected that he threw the knife into the river. Imagine this sensitive boy at school, surrounded by rough, careless, and unsympathizing mates, under the control of a grim ogre, called a schoolmaster, who was for ever devising new punishments wherewith to torment offending scholars. This man was ingenious in his methods of torture, a man of the old Inquisition stamp, to whom mere flogging was too commonplace to satisfy, and who experienced a relish in suspending a child by its thumbs by cords and a pulley! Under this man's brutal rule young Scoresby acquired but little information; he was, he says, "terrified," and surely he had some reason for this feeling. Oh, for the wide sea! oh,

for the ice-fields and the whales ! oh, for anything but this close room and the grim spell of the tormentor.

William's first voyage to Greenland took place when he was ten years old. It was undesigned on his father's part, but planned on his. He had gone aboard to look at the ship, and was to return with the pilot, but he concealed himself below, and offered no response when called for. A peremptory call, however, from his father brought him to the top of the companion, where he stood bareheaded without his hat. His father, perceiving his strong desire to remain, gave permission, and young Willie was soon rigged out as a sailor, everybody's pet aboard.

But though young Willie was allowed to make this voyage, he was sent to school again on his return. It was a school very differently conducted from that which he had left, and he progressed favourably. On attaining his sixteenth year, he began his sea life on board his father's ship, the "Resolution," and soon rose to the rank of first officer ; but his leisure moments were still employed in the study of mathematics and other useful branches of information.

The Greenland fishery, in which young Scoresby was engaged, had long been of considerable mercantile importance. The precise period at which England first engaged in the traffic is not authenticated. Russia, France, Holland, Spain, Denmark, and other countries, all participated in the profits. England in vain attempted to make a monopoly, and in the effort to do so, lost ground, and the trade declined. A joint-stock company, towards the end of the seventeenth century, lost £82,000 in the Arctic Seas ; the South Sea Company would no doubt have lost as much, if they had had it to lose. Attempts to revive the trade by shareholding policy were obviously imprudent, so encouragement was offered in the shape of Government bounty, and under this stimulus ships and sailors were found, and at the time of which we are writing, twenty vessels were despatched every year from the port of Whitby alone. It was a rapidly rising trade and a paying trade ; for whereas Scoresby's father, as seaman, boat-steerer, and harpooner, could, in the early days of the revived trade, gain but a few pounds per annum—Scoresby's son, in the days of the trade's revival, realized seven or eight hundred a

year. The whale fishery was looking up when Scoresby's son went into it; and no better man than he could be found to handle a harpoon, to manage a ship, to bring home oily wealth well stored to shipowners at home.

Now there appears at first sight very little in the chase and capture of whales calculated to enlist the sympathies and develop the intellectual powers of a thoughtful man. No doubt whales are valuable prizes; oil, blubber, spermaceti, whalebone, all are very useful commercially, but not intellectually; the contrast one imagines between pursuing a wounded whale and pursuing a course of study in the University of Edinburgh, must be very striking, and yet these are the alternations of Scoresby's early life. Now we see him with a few hard-fisted fellows chasing a whale, which strikes the boat such a terrible blow that the bottom is driven in, and it sinks in a moment; and now we see him slowly ascending the college steps—slow, for he is short of breath, and bent on mastering a knotty problem. Every opportunity that offered for obtaining information on any subject—was it not all fish that came to his net?—he turned to excellent account, gathering

up every fragment of his disposable time, now learning mathematics, now to beat a little upon the drum, but returning again to his oily friends of Greenland to enrich himself with spoil.

In 1807 there was a call made upon all seamen, especially those engaged in the Greenland trade, to assist the British Government in bringing the fleet captured from the Danes into an English port. That fleet, it was very well known, would be placed at the service of Buonaparte, and as Buonaparte was then the man against whom the bitterest enmity was felt in England, to deprive him of this advantage was felt to be a matter of importance. The English accordingly demanded that the charge of the Danish fleet should be entrusted to them. This demand the Danes refused, but the bombardment of Copenhagen convinced them of the impossibility of offering effectual resistance, and they capitulated accordingly. A British fleet was to hold possession of the Danish vessels, and seamen were wanted for carrying out this duty. Among the first who volunteered was young Scoresby. On his name being announced, fifty-four followed his example. He wanted to learn something of the discipline of the royal

navy, and he was right loyal in his sentiments, fully convinced that whatever was, with regard to the movement of the British Government, was right. He saw much that pleased, much that shocked him ; he saw power, which, invested in able hands, was capable of effecting great good, frequently abused ; he saw men tied up and lashed for petty faults, or for no fault at all ; he found officers of the same stamp as his terrible pedagogue ; at the same time he witnessed many gallant acts, saw much of efficient discipline, and picked up much useful information. At Copenhagen he narrowly escaped a Danish prison ; for going ashore, he missed his way, and remained too long, so that the boat which had brought him returned to the ship, and he had great difficulty in procuring another. Shortly after this, the vessel on which he was aboard was discovered to be on fire, with scarcely an inch between the fire and the powder magazine ; he was also in peril by water, in a swampy gunboat, only kept afloat by the constant exercise of the pumps. On his way home, he encountered the most alarming hazard of shipwreck, a circumstance which made a very deep impression on his mind.

This danger fell upon Scoresby while aboard the ship "Seyeren." The commander was a tyrant—a dealer-out of cat-o'-nine-tails' stripes with no sparing hand; he was, moreover, given to imbibe too freely, and ill able to take care of the ship in the best of weather: in peril and perplexity he was incapable of any useful work; and on the homeward voyage the weather was tempestuous, especially so as the vessel approached the dangerous sands known as "the Galliper." It was a pitchy dark night; the wind blowing "great guns," the sea running high; the captain the worse for liquor; the crew sullen and dissipated. Suddenly there was a cry raised; there were breakers a-head; breakers which shone out of the darkness with a phosphorescent and terrifying lustre; the rain poured in torrents, the waves washed over the deck, the sails were torn to shreds: all was terror and confusion. The piercing screams of women and children; stern men wringing their hands in dismay; orders and counter-orders vociferously shouted by pilot and commander; the vessel quivered in every timber, as though it were a thing of life and trembled at the impending danger. It was an awful moment—a moment

which was never erased from Scoresby's mind ; he felt, even as the ship entered the breakers, and struck, a vague and inexplicable confidence that a merciful God would save so large a number of immortal souls. He was not afraid ; and the ship glided through the sand, and floated again safely in deep water !

Throughout this volunteer voyage in the service of the British navy, Scoresby went through the work of an ordinary seaman ; he was exposed to all the inconveniences and trials of his messmates, and though treated occasionally with some marks of respect, fared badly enough on the whole. He spent all the money he had with him, by frequent purchases supplying himself with stores, in which the allowance of the ship was deficient, and by frequently contributing to the wants of his messmates, so that when he landed at Portsmouth he had not a shilling. He received for his services during this trying and adventurous voyage £11 19s. 2d.—the amount of bounty, travelling-money, and wages for three months' service. Until he received this sum he was forced to remain on board his vessel, as the remittance which his father sent on to him

was not negotiable, being merely an order on a London banker.

To London Mr. Scoresby was to proceed by his father's instructions, there to make the acquaintance of Sir Joseph Bankes, at whose Thursday morning breakfasts he found ready welcome and many friends. Here again we have another of those strong contrasts with which the life of this eminent man abounds. A few days after sharing the hardships of a common sailor's life, under the orders of a brutal commander, almost frozen with cold, and well nigh starved for want of proper food, he was the honoured guest of the leading scientific men of the time—one of a brilliant and distinguished coterie in the first city of the world.

There was that in Scoresby which made him welcome everywhere. Fond of information, bent upon improvement, turning everything to good account, he availed himself of every novel situation; and, encouraged by the scientific circle of which Bankes was the centre, he began to relate what he had seen in Arctic regions. The sailor's story was full of novelty and interest. His knowledge of polar vegetation, his experiments on tem-

perature, his examination of crystallized snow-flakes, were marked by closeness of observation and originality of theory that warranted all the agreeable things that were said of him by his new friends. But books, drawings, microscopes, must be laid aside for compass and harpoons. Scoresby must again busy himself in the fishery. Thus alternating between the intellectual refinements of cultivated men, and the rude, rough company of sailors and fishermen; between calculating yields of whale oil and blubber, and scientific speculations or abstruse research, he spent the early years of his life. When opportunity served he would study at Edinburgh; or spend a few weeks in the agreeable society of his London friends; but the North Seas claimed the largest share of his attention, and the shipowners of Whitby looked upon him as the most successful fisher on the Greenland station. For ten years Mr. Scoresby and his father commanded the ship "*Resolution*," during which time she never met with any accident nor suffered the least damage. During the ten years no less than 249 whales were captured by her, yielding 2034 tons of oil, which, with the whalebone, bounty, and premium on

capital, produced £70,077 12s. 3d. The expenses during the same period, including everything, amounted to £49,358 18s. 1d., leaving a clear profit for the proprietor (for an original advance of £8000) of £20,718 14s. 2d.

While thus busily occupied, Mr. Scoresby, encouraged by many eminent scientific men, contributed several important papers to the philosophical societies. His opportunities of observing the phenomena of the Arctic Seas were not permitted to escape him in the practical duties of the whale fishery. The probability of accomplishing an important object by sailing northwards from the Pacific, between America and Asia, had led to the third voyage of Captain Cook; but the disappointment which ensued, led to the neglect of the Polar regions until Mr. Scoresby recalled attention to them. We are indebted to him for most of our knowledge of those frozen seas, and for many interesting facts in association with them. He discovered that the most transparent pieces of fresh-water ice were capable of concentrating the rays of the sun so as to produce an intensity of heat capable of melting lead and igniting gunpowder. He it was who was the

first to draw special attention to the ice blink—a band of lucid whiteness, caused by the glare of light reflected obliquely from the surface of the ice against the opposite atmosphere, and consequently discerning the presence of masses of floating ice at a great distance. These appearances point out to the experienced voyager not only the extent and figure, but also the quality of the ice, twenty or thirty miles beyond the limits of direct vision.

Mr. Scoresby observed that a singular effect was often produced by the ice blink, called looming, whereby objects near the horizon appeared distorted, repeated, and often elevated into the air. On one occasion he approached so near the unexplored shores of Greenland that the land appeared distinct and bold, but the outline of the scene was constantly changing. "Its appearance," Mr. Scoresby says, "was that of an ancient city, abounding with the ruins of castles, obelisks, churches, and monuments, with other large and conspicuous buildings. Some of the hills seemed to be surmounted by turrets, battlements, spires, and pinnacles; while others, subjected to one or two reflections, exhibited large masses of rock,

apparently suspended in the air, at a considerable elevation above the actual termination of the mountains to which they referred. The whole exhibition was a grand phantasmagoria! Scarcely was any portion sketched before it changed its appearance, and assumed the form of an object totally different. It was, perhaps, alternately a castle, a cathedral, or an obelisk; then expanding horizontally and coalescing with the adjoining hills united the intermediate valleys, though some miles in width, by a bridge of a single arch, of the most magnificent appearance and extent. Notwithstanding these repeated changes, the various figures represented in the drawing had all the distinctness of reality; and not only the different strata, but also the veins of the rocks with the wreaths of snow occupying ravines and fissures, formed sharp and distinct lines, and exhibited every appearance of the most perfect solidity."

But the main interest attaching to the Arctic regions is that which is associated with the idea of a sea communication between the Atlantic and Pacific. The idea was first suggested four hundred years ago; it has been revived at intervals

since that time, and more than a hundred voyages have been undertaken with the view of discovering this passage. In old times Willoughby, Chancellor, Barentz, Davis, and Hudson, conducted expeditions to the Polar Seas ; in modern days the names of Ross, Parry, Beechy, Bellot, and Franklin, have become identified with the Arctic regions. The loss of money, the sacrifice of life, the endurance of extreme suffering, have been occasioned by these expeditions ; but British energy and determination have not yet given up the hope of success. Mr. Scoresby was firmly persuaded of the practicability of the sea communication between Europe and China. The following are the chief arguments which he adduced in favour of this idea :—

1. "The prevailing current in the Spitzbergen sea flows, we are well assured, during nine months of the year, if not all the year round, from the north-east towards the south-west. The velocity of this current may be from five to twenty miles per day, varying in different situations ; but it is most considerable near the coast of Old Greenland. The current, on the other hand, in the middle of Behring's Strait, as observed by Lieu-

tenant Kotzebue, sets strongly to the north-east, with a velocity, as he thought, of two miles and a-half an hour, which is greater, however, by one-half, than the rate observed by Captain Cook.

2. "By the action of the south-westerly current a vast quantity of ice is annually brought from the north and east, and conducted along the east coast of Old Greenland, as far as Capo Farewell, where such masses as still remain undissolved are soon destroyed by the violence of the solar heat and the force of the sea, to which they have become exposed from almost every quarter. This ice being entirely free from salt, and very compact, appears originally to have consisted of field-ice, a kind which, perhaps, requires the action of frost for many years to bring it to the thickness which it assumes. The quantity of heavy ice on surface which is thus annually dissolved may, at a rough calculation, be stated to be about 20,000 square leagues; while the quantity annually generated in the region accessible to the whale-fishers, is, probably, not more than one-fourth of that area. As such, the ice, which is so inexhaustible, must require an immense

surface of sea for its generation, perhaps the whole, or the greater part, of the so-called Polar Basin—the supply required for replacing what is dissolved in Behring's Strait, where the current sets towards the north, being, probably, of small moment. The current in opposite parts of the northern hemisphere being thus found to follow the same line of direction, indicates a communication between the two across the Poles; and the inexhaustible supply of ice, affording about 15,000 square leagues, to be annually dissolved above the quantity generated in the known parts of the Spitzbergen seas, supports the same conclusion.

3. "The origin of the considerable quantity of drift-wood found in almost every part of the Greenland sea, is traced to the same country beyond the Pole, and may be brought forward in aid of the opinion of the existence of a sea communication between the Atlantic and the Pacific; which argument receives additional strength from the circumstance of some of the drift-wood being worm-eaten. This last fact I first observed on the shores of the island of Jan Mayen, in August, 1817 and confirmed it by more particular obser-

vation when at Spitzbergen the year following. Having no axe with me when I observed the worm-eaten wood, and having no means of bringing it away, I could not ascertain whether the holes observed in the timber were the work of a ptinus or a pholas. In either case, however, as it is not known that these animals ever pierce wood in Arctic countries, it is presumed that the worm-eaten drift-wood is derived from a trans-polar region. Numerous facts of this nature might be adduced, all of which support the same conclusion.

4. "The northern faces of the continents of Europe and Asia, as well as that of America, so far as yet known, are such as render it difficult even to imagine such a position for the unascertained regions as to cut off the communication between the Frozen Sea, near the meridian of London, and that in the opposite part of the northern hemisphere, near Behring's Strait.

5. "Whales, which have been harpooned in the Greenland seas, have been found in the Pacific Ocean; and whales, with stone lances sticking in their fat (a kind of weapon used by no nation now known), have been caught, both in

the sea of Spitzbergen and in Davis's Strait. This fact, which is sufficiently authenticated, seems to me the most satisfactory argument."

While occupied in the busy and unrefined toil of the Greenland fishery, devoting his leisure to scientific pursuits, Mr. Scoresby's mind was deeply affected by religious truth. His marriage with Miss Lockwood tended to strengthen these impressions, and he became strict in the outward observance of religion, without, as he himself informs us, experiencing anything of that inward holiness without which all outward observance is but dead formality. But a man of vigorous intellect and warm affections was not likely to be decoyed in a matter of so much importance. In the heyday of his prosperity he was sometimes forgetful of these things, and turned a deaf ear to the voice of conscience; but trouble came, disastrous voyages, discontent expressed by the ship-owners, unaccountable failure where others were successful. "But this," he says, "was only the beginning of what the world would call my change of fortune. God, in His great mercy, was now beginning to call me by the voice of His providence, which was at length so determinate





and irresistible that His gracious designs in my behalf were accomplished." Scoresby's voyages became increasingly unprofitable, the dissatisfaction of the owners openly expressed, his own mind more and more impressed with religious truth. "I will leave off the sea," he thought; "the little property I have acquired will produce £120 or £150 a-year, and on this with any accidental acquisition from finding out other employment, I may live, in an economical manner at least, on shore; I shall then be no longer exposed to the freaks of fortune, but shall defy all casualties and mortification of unsuccessful voyages, and may have the continued enjoyment of domestic intercourse and blessings of the land." But in making these resolutions he felt that he was relying too much upon himself, too little upon God. On returning home he found that a large part of the fortune on which he relied had been lost in the bankruptcy of an old friend. But it was possible to be a Christian and still to go a fishing —any honest occupation may be religiously followed. *Laborare est orare.* Scoresby began to pray with his men; to preach to them; to forbid all work on Sundays; to "set the Lord before

him," and to find his "ways the ways of pleasantness, his paths the paths of peace."

Wealth might be still attained in the whale-fishery; fame still won in the world of science; but there was in the heart of Scoresby a yearning desire to proclaim the good news that had come to him "as cold water to a thirsty soul." He had been consulted on the advisability of fitting out Arctic expeditions; his book on the Arctic regions had met with extraordinary success; he had achieved a reputation equalled by few, excelled by none, who had treated of the Polar Seas; but all this became as nothing to him; it was not the north-west passage which now concerned him, but the passage from this world to the next.

If there be wanting one link in the golden chain which links heaven to earth in the soul of an earnest man, Azrael, the death-angel, can supply that link—DEATH! Let the word stand alone; look at it, ponder it; what does it mean? What that truth signifies to a man whose vision is bounded by an earthly horizon, it needs not to tell. To a man whose ken extends beyond things seen, that word means LIFE: unsullied happiness, immortal youth! Death had entered the home of

Scoresby while he was busy in the Arctic Seas, and returning he found his home desolate, his wife in the grave !

Soon after this severe bereavement, Mr. Scoresby quitted the sea, and resolved on becoming a minister of the gospel. It might have been comparatively easy for him to have entered one of the Dissenting denominations, or to have become an evangelist without connecting himself ministerially with any sect or church. But he was a member of the Church of England, deeply and thoroughly admiring its services and discipline, and as an accredited minister of the church he was resolved to preach the gospel. This resolution necessitated his entering college. He had to master the classics, of which he was ignorant ; there was much to be learned ; many obstacles to be overcome ; but he overcame them, and in the month of July, 1825, he was ordained, and entered on his ministerial duties at Bessingby.

The sailor had become the clergyman :—

" Simple, grave, sincere,
In doctrine uncorrupt, in language plain,
And plain in manner ; decent, solemn, chaste,
And natural in gesture."

“They that go down to the sea in ships, that do business in great waters ; these see the works of the Lord, and His wonders in the deep.” “And Jesus said unto them, Come ye after Me, and I will make you to become fishers of men.” How could the sailor forget the sea ? Surely it needed not that he should. His heart yearned after the brave fellows whose companion he had so often been in peril and danger. To them especially he felt that he should preach. The mariners’ church at Liverpool—a ship of war fitted up as a place of worship—became the scene of his most successful labours. There, to attentive congregations of sailors, he told the gospel story, his nautical illustrations rendering his discourses peculiarly acceptable to the class whom he addressed.

After some years of useful labour at Liverpool, Mr. Scoresby was appointed minister of Bedford Chapel, Exeter. In Exeter, during the prevalence of that fearful epidemic, the cholera, his attentions to the sick and dying—for what fear knew he?—were characterized by the same warmth, energy, and determination which marked all that he did. He was subsequently appointed to the vicarage

of Bradford, having attained the degree of Doctor of Divinity. At Bradford he was shocked by the deficiency of church accommodation, but in his efforts to extend the means of attending public worship, he was encountered by formidable opposition. It was a period of agitation and excitement; bread was dear, and "flesh and blood" were cheap; secret societies and trades' unions were urging the labouring classes to resist the employers; chartist riots were taking place in different parts of the country; the "*parsons*" were being painted by demagogues as so many hungry vultures, and Dr. Scoresby met with rough and abusive language for some of the most self-denying labours that ever Christian preacher undertook. Four schools were built by him, at a cost of about £4000, and, with one exception, entirely on his own responsibility as to the funds. When he came to Bradford, there was not a single child under daily instruction in connection with the church; when he left there were 1500 day scholars and 1200 Sunday scholars; the parish was subdivided into districts, efficient curates appointed, and a Church Institute established. All this was accomplished at great personal sacri-

fice. The clergyman's receipts were below those of the sailor ; the vicar of a parish of 120,000 souls deriving less pecuniary profit for his labour than the captain of a Greenland whaler ! Dr. Scoresby had been abused, misjudged, misrepresented ; his health had become impaired, which a visit to America did little to improve ; family bereavement had fallen upon him, and he was greatly cast down. Notwithstanding all these adverse circumstances, his contributions to science had not been withheld ; in the midst of heavy duties and heavy calamity, he still found time for literary and scientific pursuits.

On retiring from the vicarage of Bradford, Dr. Scoresby paid a second visit to the United States. On the return voyage, rough weather afforded him the opportunity of testing the height of the Atlantic waves. In the midst of the stormiest weather, when every passenger kept down below, and everything was lashed on deck or carried overboard by the surging sea, the sailor-clergyman might have been seen on deck in all sorts of odd postures, sometimes tiptoe on the paddle-box, sometimes scrambling on the cuddy, always trying to look over the crest of

the highest wave, and invariably exciting the indignation of the quiet passengers, who could see nothing in these eccentric movements but the vagaries of an escaped lunatic. He carried on his investigation, however, with complete success, and the result was the following important facts: —that the height of Atlantic waves is 43 feet, mean distance between each wave 559 feet; width from crest to crest 600 feet; interval of time between each wave 16 seconds; velocity of each wave per hour $32\frac{1}{2}$ miles.

On his return to England, Dr. Scoresby settled at Torquay, where he shared the duties, gratuitously, of Upton church with the Rev. Mr. Wolfe, perpetual curate, and devoted as much time as was compatible with the efficient discharge of these duties to scientific and literary pursuits. After his settlement at Torquay he produced in rapid succession the following works:—“The Franklin Expedition,” “Jehovah Glorified,” “Sabbaths in the Arctic Regions,” “The Mary Russell,” and several important contributions to the papers of the philosophical societies.

The more interesting and valuable scientific labour of the latter days of Dr. Scoresby was his

carefully-conducted magnetical investigations. With the object of fully establishing the theory which he had laid down, he planned and accomplished a voyage to Australia. Shortly after his return his health, which had been impaired for some years, became decidedly worse. The symptoms were alarming, and none knew better than he that death was at the door. But the faith and courage which had animated his life forsook him not as the day declined. He was confident that the great Captain would give his shattered bark an "*abundant entrance*" *into the heavenly harbour*. So died the sailor-clergyman, beloved, honoured, esteemed; the member of five-and-twenty learned societies, wide scattered over the world; the author of nearly a hundred literary works; great as a Greenland whaler, great as a Christian preacher, great as a student of science, greater than all as a true man—faithful to God and his duty—illustrious in the peerage that is not of earth.

THE TWO BRUNELS:

A STUDY FOR YOUNG ENGINEERS.

SIR M. I. BRUNEL.

WHEN London was little, there was a famous engineer—a priest, of course—for in those days the priests had all the learning to themselves, and it was enough for a gentleman to bear a lance and carry his hawk “faire;” this priest was skilled in engineering, and he built a bridge, or helped to build it, which lasted many a century, and which formed the ordinary means of communication between the city and the pleasant villa of Southwark, over the water. Honour to the priest! And when London had grown large, leaped over the old barrier, and strayed far a-field, another “celebrity,” educated for the priesthood, and forsaking the cloister for the workshop, constructed ingeniously below the water another medium of communication—a tunnel under the Thames, built

so taut and trim, that centuries may elapse before it yields, and mayhap the notorious New Zealander—Macaulay's, or somebody else's—may find more interest in this singular work than in the ruined walls of the cathedral or the broken arch of London Bridge.

Mark Isambard Brunel was born at Haqueville, in Normandy, in the year 1769. The village stands in the midst of rich corn land: a level of golden glory, a plain of plenty; and although in the small cluster of houses there is little to interest the traveller, and still less to bring out the artist's sketch-book, there is an attraction in the place for all who admire worth and talent, and who are willing to make pilgrimages to the holy sites of departed genius. There Mark Isambard was born. His family had for many generations held a respectable position as landowners, farmers, and the like; playing no very conspicuous part in the troubled history of France, but doing what was in them for the welfare and prosperity of their country. Nicholas Poussin, the painter, is counted among the ancestors of the Brunel family, and his engineering descendants, ^{the} and son, seem to have borne

in mind, and carried out into practice his excellent advice—"Whatever is worth doing is worth doing well." It was the rule of his conduct, it was the rule of theirs. When late in life he was asked by what means he had gained so high a reputation, he emphatically replied, "Because I have neglected nothing." The same reply might have been given, had the question been asked as to their success, by the Brunels.

Neglected nothing! there were no "trifles light as air" to Mark Isambard Brunel; nothing was imaginary, every thing deserved attention. His father intended him for the church, and he was sent to study under the monks of Gisors; but the architecture of the old church had more interest for him than the lessons of the churchmen; that singularly-twisted column in the south aisle, with its spiral bands of tracery; the organ-loft and monumental effigies, the uncouth sculptures and the French-florid Gothic architecture, set his mental machinery in motion, not in Aves and Paters, and Credos, but in the strength of building material, on wood-carving, stone-cutting, painted windows, and the engineering skill of the cowled monks who had gone to their rest.

When young Brunel came home for the vacations, he felt relieved from dusty learning, the lore of ancient tomes; and was ready enough to lay aside the evangel and breviary, the grammar and the lexicon, for saw and hammer, chisel and plane. I have heard of a Mexican priest tucking up his gown to dance the bolera, but here was a priestly scholar tucking up his sleeves to work at a carpenter's bench, and to work with a will. The carpenter's shop at Haqueville was his favourite resort, and the carpenter his very willing instructor, busy talking about this, that, and the other, as he shaved off wooden ringlets from the deal. When young Brunel grew older, he went to Rouen to study in its seminary, and one day when he was about fifteen, saw on the quay of the old town the component parts of a steam engine. It was the first time he had ever seen anything of the kind, and his delight was unbounded. "When I am a man," he said, "I will repair to the country where such machinery is made."

Surely such a boy was not fit for a priest. He would have made a priest after the Roger Bacon pattern, and might have shared his fate.

Light should never be hidden under a bushel, and the engineering light, the scientific lustre of Brunel, would certainly have been hidden under an ecclesiastical cover. To the credit of the monks of Gisors and Ronen, be it said, they saw this, and suggested that the lad should be allowed to follow his own inclination. The church was not adapted for him ; the blessing he was to give the world was not the benediction of out-stretched hand and breathed syllables. His predilection for the physical sciences was so strong, his genius for mechanism and mathematics so obvious, that it was resolved he should follow a more congenial pursuit. Civil engineering at that time held no important place in general estimation ; so that it was settled he should study navigation and go to sea. The Marechal de Castrier gave him an appointment, and on board a French vessel he made several voyages to the West Indies, and saw more of life in a few months than he would have done in three score years and ten if settled as a parish priest or numbered with monastic brothers.

The leisure afforded to Brunel on board ship was studiously employed. He manufactured a

sextant for his own use ; he was always busy contriving some labour-saving scheme—doing by machinery what had been done by manual labour ; every body liked him, for he was as good and sociable a fellow as ever trod a vessel's deck, could do as others did, and was never self-asserting in his superiority of intellect.

While Brunel was absent in the West Indian states, things social and political were becoming daily more explosive in France. The people were growing weary of hard fare, hard usage, heavy burdens, the folly, improvidence, wickedness of bygone generations of butterfly nobility had accumulated, and were pressing heavily on the nation. There were rumours of coming evil—dark louring clouds in the sky, and distant peals of thunder. But the aristocrats saw no sign of the coming storm ; they heard, perhaps, that the people—a many-headed monster, lampooned and caricatured in the public prints, was crying for bread ; as to revolution, the only sort of revolution they feared was one of costume, for had not somebody or other actually come to court in shoe-strings instead of buckles ? But the change came ; the murmurs which had at first been

almost as slight as the murmuring in a sea-shell, grew louder and louder, and swelled into a roar—a shout of angry defiance and long pent-up fury—a tiger-howl for blood. The national barber was at work, shaving off heads under supervision of M. Sanson, hereditary executioner, who had his salary raised in consequence, and worked hard for his pay. Brunel, his mind full of odd schemes for winding cotton, for improving tinfoil, for cheapening ship-blocks, etc., etc., came back, little suspecting, even from the report he had heard, how terrible the revolution really was. He was a loyalist, an aristocrat the republicans would have called him, and Dr. Guillotine's invention would have put an end to the inventor if he had not escaped by flight. The blood-stained carcases of royalty were thrown into quick-lime graves; all who loved royalty were to share their fate; it was no time for a quiet inoffensive man to work out mathematical and mechanical problems, every man must be up and doing, or else become another victim to the unpopular cause.

Brunel fled, and found a refuge in America. In the United States he commenced business as

an architect and surveyor, and his first engagement was the survey of a tract of land near Lake Erie. He was next engaged in cutting canals, and was employed in the erection of an arsenal and cannon foundry at New York. He submitted designs of an highly ornamental and beautiful description of the House of Assembly at Washington, but they were declined, on the ground that they were too decorative to comport with the simplicity of a republic.

Shortly after this he accepted the responsibility of building the New Bowery Theatre (since destroyed by fire), and his work was highly approved, the edifice being in all respects well adapted for the purpose for which it was designed.

But the idea which he had formed as a child of visiting the country chiefly famous for engineering skill, coming to England, was still uppermost in his mind. He had elaborated a plan on which he had dwelt for many years—that of substituting mechanical for manual labour in the construction of ships' blocks. The United States offered no sufficient encouragement to induce him to remain, and the prospect of success in England was enticing; so in 1799 he shipped for the old

country, and came as a friend and brother amongst his "natural enemies."

That he should succeed immediately; call at the Admiralty, submit his plans, find them approved, tested, adopted, and himself rewarded, before many weeks were over, was not to be expected. The lesson of experience is that a man must work and wait, if he would succeed, and of the two duties the latter is often the most difficult, often the most severely tried. It is especially tried when any question of improvement becomes entangled with red tape; there is so much stationery to be used up, so many big letters to be written, so many massive seals to be attached, so many questions and answers to be duly taken down, revised, submitted, returned, revised again, submitted again, and duly registered, that many a brave heart has broken under it, and many an impatient man has gone off and sold his secret to a more prompt and liberal government. Brunel, however, persevered; and his system was at last, after a weary, weary while, adopted. Maudesley was entrusted with the work. Machinery triumphed over manual labour, as it always must; £24,000 was saved in one year to the Government,

and two-thirds of that sum was bestowed on the inventor.

Brunel, thus brought into notice, was soon engaged upon other great works; he was employed in the erection of saw-mills at Chatham and Woolwich; but his comprehensive genius for things small as well as great could not remain idle, as it would have been in mere routine work. He invented a machine for winding cotton balls; he produced also a machine for taking several copies of a document at a time, several pens being made to move at once, and the copies being thus rapidly and efficiently produced; next came a simple portable copying machine; next, a machine for making boxes used by druggists, all of which were before that time manufactured in Holland; next, a machine for making shoes, patronized by the Duke of York, and employed largely in the army; next an improvement in the preparation of tinfoil for ornamental purposes. Brunel threw off these things as a gifted poet might throw off light verses while engaged on some great epic; they were the mere offshoots of his genius. Singularly observant in his habits he never beheld any defect (and few things escaped him) without a desire to remedy

it, and his desire was generally practical. He was busy with great engineering works, everywhere in request, every moment occupied, but he was never too busy to suggest improvement.

Steam navigation was a subject in which Brunel was much interested. He was among the original promoters of the Ramsgate steamboats. Ah, that engine which he had seen on the quay of Rouen was never out of his mind ; it had brought him to England, and raised him to an eminent position. Did he ever dream, I wonder, of the mighty vessel which his son should build, and which should carry its gigantic self over the blue waves to the land where his father found a refuge ? Brunel had the notion of applying liquefied gases as a motive power, but this and some other schemes of his, were decided by Government to be too chimerical to be entertained.

There was one subject, however, which, chimerical as it might seem, was tolerated and promoted by Brunel, it was the great work of his life—as the “Leviathan” was the great work of his son’s life—it was the tunnel under the Thames.

A tunnel under the Neva had, it is said, been suggested by Brunel to the Emperor of Russia.

Such a work during the long winters which visit that empire would have been of great service, but for some unexplained reason the suggestion was never adopted.

With regard to the Thames Tunnel, as far back as the year 1802, a project was started for the opening of an archway under the Thames from Rotherhithe to Limehouse. A Cornish miner was selected as the engineer, and he, having made some borings at the Horseferry and on the opposite side of the river, reported that he was firmly persuaded that the undertaking would not cost so much as had been conceived. A company was accordingly formed under the title of the Thames Archway Company, and a subscription raised. An Act of Parliament was obtained and the work began. The engineer commenced operations by sinking a shaft of eleven feet diameter at three hundred and thirty feet from the line of the wharf at Rotherhithe. But the obstacles which he experienced from the nature of the ground, increased to such a degree as he proceeded, that he was, at the depth of forty-two feet, obliged to desist. Another more enterprising man engaged to complete the shaft. He reduced it to eight feet, and

carried it down to a depth of seventy-six feet, where he stopped, as he reported that it would be dangerous to go deeper. Another engineer (1807) was employed by the Company. Before opening the drift, both engineers agreed to reduce its breadth, and finding the ground at the depth of seventy-six feet to consist of firm, dry sand, they opened the drift and carried it forward in a gentle ascent. This drift, with one or two accidents of no material importance, was carried on through eight hundred and fourteen feet of firm, dry ground, and one hundred and thirty-eight feet through a bed of calcarious rock. On the 26th of January, 1808, the river broke through, under the influence of an extraordinary high tide ; but the engineers succeeded in filling up the hole, and the miners resumed their work. Scarcely had they done so, however, when the water broke through afresh, and it was declared quite impracticable to go on except by means of a coffer-dam or caisson. In March, 1809, a reward was offered by the Directors for the most approved plan of completing the *Thames Archway*.. Fifty-four plans were submitted, all of which were referred to scientific men, who unanimously declared that an archway of any

useful size was impracticable under the Thames, in any of the plans that came before them.

Several years elapsed, when Mr. Brunel was prevailed upon to turn his attention to the subject. He at length consented; looked through the documents connected with the first attempt; he found nothing in them to forward his object; they were the record of failures, the suggestions of impracticable men; they might be thrown away as yonder piece of rotten wood.

But Brunel was a man of observation, and a piece of rotten wood might suggest more than the most elaborate record of misadventure. Here was a piece of a ship's keel, worm-eaten, corroded by the worm called the teredo. Isambard Brunel saw something in this; noticed how the tiny creature had perforated the wood with its armed head, first in one direction, then in another, till the archway was complete; and then daubing over the roof and sides with a sort of varnish. What if he copied on a grand scale this minute work? Would not this enable him to triumph where others had been defeated? It was worth the trial. From the operations of the teredo Mr. Brunel conceived it practicable to

make a circular opening of sufficient capacity at once. He described in his specification two modes, and he gave the preference to that of proceeding by forming at the same time several continuous excavations by means of an apparatus called the shield. This shield consisted of twelve parallel frames, lying close to each other like so many volumes in a book-case. Each frame being nearly twenty-two feet in height, was divided into three stories; the whole presented therefore thirty-six openings or cells, from these cells the miners operated by small quantities at a time, like so many teredos, and were enabled to erode the ground in front, while others at the back brought up a substantial encrustation, namely, the massive brick stratum of the tunnel. For locomotive action, each frame was provided with two substantial legs, resting on equally substantial shoes. Those legs were provided with articulations that fitted the frames for a pacing movement.

The plans of the engineer having been submitted to his Grace the Duke of Wellington, Dr. Wollaston, and others, and approved, the "Thames Tunnel Company" was incorporated in 1824, and

the work was begun in March, 1825. A shaft fifty feet in diameter was constructed. "The structure was in the first instance laid upon piles, and raised to the height of forty-two feet, including a cast iron rim, intended to act as a cutter. A steam engine of thirty horse power was mounted on the top of the structure. In this state, the piles being removed, this tower was brought to rest upon the edge of the cast iron rim. It is easy to comprehend that, by clearing the ground inside, the whole must have descended. In this manner a structure weighing 1200 tons was lowered to the depth of forty feet, through a stratum twenty-six feet deep, consisting of gravel and sand, full of water, wherein the drift-makers had met with almost insurmountable obstacles. It is to be remarked that for this and for the whole operation of the tunnel, the engineer did not employ a larger steam engine than had been required in the operations of the drift-way."

Of course it is not to be supposed that Mr. Brunel came, saw, conquered without an effort, without difficulty, without delay, and the prospect to all but himself of failure. The Thames asserted itself; broke through more than once or

twice, and threatened to sweep away the miners ; but the colossal shield steadily progressed, from marshy to solid ground, from solid ground to marshy. One day the engineer had occasion to meet the directors, and he told them, much to their dismay, that when the tide was at its full that day, he conceived the bottom of the river would break down, that an accident must occur ; but he quieted their alarm by assuring them that he had provided against it. What he predicted took place, but thanks to his precautions, it was attended by no serious result. The invading river strove hard to rush in on other occasions, but without success. The influence of the tide upon the ground, to a depth of not less than thirty feet, was a circumstance which contributed more than any other to multiply difficulties. The bottom of the river was examined by means of a diving-bell. On the first occasion a shovel and hammer were left at the bottom of the river, and on the second could not be found ; but about a month later both were discovered, having sunk eighteen feet into the ground.

On the 18th of May, 1827, the river broke into the tunnel, but through the indefatigable ex-

eritions of the engineer, it was sufficiently clear to be entered by the 21st of June. "Nothing can convey so just an idea of the impetuosity of the irruption as the state in which the invert of the arch was found. There the brickwork was reduced to nearly one-half of its thickness, as if it had been battered with cannon-balls of small calibre; at the thickest part of the foundation a hole was open, as if made by the fall of a fourteen-inch shell. Some heavy pieces of casting belonging to the shield had disappeared, but they were found afterwards driven into the ground as if forced by a powerful ram."

Another irruption occurred in the beginning of the following year, in which the younger Brunel nearly lost his life; but the effect of the accident was overcome as on the former occasion, and gradually the work was completed, every risk of failure only lending, as it were, new strength and energy to the heroic engineer. The most disastrous accident was that which, in August, 1828, filled the whole tunnel with water, and delayed the progress of the work for a very considerable period. The work was recommenced in January, 1835, thousands of sacks of clay being

thrown into the river-bed above it, and it was finally completed and opened to the public in March, 1843.

The work is 1200 feet long, and consists of a double roadway, separated by a wall, pierced at intervals by arches. The descent and ascent are by cylindrical shafts of 100 steps each. The whole is well lighted with gas, and the toll is one penny. Government lent £247,000 to advance the work, and the whole cost is estimated at £620,000.

Eighteen years of Brunel's life were thus expended chiefly in the construction of the Thames archway, which had baffled the engineering skill of so many other men, and threatened to overcome even all his energy and genius. He triumphed, but it cost him dearly; long years of waiting, long years of suspense and patient toil; his health gradually breaking under, but still bravely holding on his way, and seeing the work achieved at last, when he had passed the allotted age of man.

And so he died six years after the completion of the great work of his life—died full of years and honour, bearing from his own country the

legion of honour, and knighthood from that of his adoption.

He died on the 12th of December, 1849.

BRUNEL THE YOUNGER.

AMONG the host of modern engineers brought forward by this engineering age, the two Brunels occupy the most prominent position, father and son, alike famous, though less of romantic interest attaches to the son's life than to the father's. To have a father before you has its penalties as well as its advantages. The elder Brunel, as we have seen, was designed for the church, and escaping from the ecclesiastical strait-waistcoat (for so would stole and cassock have been to him), sent to sea, mayhap as a scapegrace, who the sooner he had his head knocked off the better. He had been debarred his favourite pursuits many a time, shut up in a room alone with some grim old portraits, to meditate on the wickedness of liking a carpenters' shop better than a church choir; he had revenged himself on one of the portraits, whose eyes seemed to follow him about, by cutting out its eyes, and leaving it thus muti-

lated as a caution to the rest; and when no pocket-money was forthcoming to buy some darling tool, he pawned his cap, and came home bare-headed, with the coveted instrument under his arm. This elder Brunel had thus absolutely fought his way to eminence, no helping hand for him; and this utter want of help is often the best help a man can have. "How do I paint," said an amateur to a distinguished artist. "Very well," was the answer; "but you want a little poverty to make you perfect."

Now Brunel was encouraged from his earliest years to follow engineering pursuits; there was no barrier closed against him; his whole education was directed towards qualifying him for the profession in which he subsequently became so distinguished. His father was his first, and perhaps his best tutor, and he had reason to be grateful that God had blessed him with a father so good and wise. This early encouragement of his genius, nay, its formation and direction, might have spoiled less energetic, self-relying, and original men. They might have sunk into second, third-rate positions, content to live on their father's credit, to eat of the renown which he had stored

up. But it was not so with Brunel the younger, he shot up into eminence of his own—an eminence never attained by his father—his enthusiasm and dashing originality surprised and delighted all who knew him; he seemed to have nothing in common with ordinary engineers; to form his plans on schemes which had never entered their heads; he was the very Napoleon of engineers, and at the head of his army of artizans—a legion of vulcans—accomplished the most gigantic works that man ever wrought in this world—a mighty man of valour this Brunel, who, when he died, died like a soldier, at his post.

Isambard Kingdom Brunel was born in 1806, at Portsmouth, where his father was engaged in constructing the celebrated block machinery to which we have already adverted. The bent of his mind was evidently for his father's profession; he soon learned how to use his knife in ingenious carvings, and so rapid was his progress that as a mere workman he would have excelled. When he was about fourteen he was sent to Paris, where he was placed under the care of M. Masson, previous to entering the college of Henri Quatre, where he remained two years. He then returned

to England, and immediately entered on his professional career, rendering his father efficient assistance in the works which he had undertaken. He possessed many advantages, all of which he turned to excellent account; thus his knowledge of drawing, which had been carefully cultivated, enabled him to draw clearly and accurately whatever he had matured in his own mind. With his own hands also he could work out with great beauty of finish the models of his own designs. It was the leading character of this man that he did everything thoroughly. He was no sloven—no petty idea of “Will it pay me?” ever entered his mind. What he undertook to do, he would do well, he rendered it as perfect as time and toil would allow. If there was a failure anywhere it was in his undertaking to do too much for too little, as it is quite possible for a man to make others and mar himself. This character of doing every thing well, and of doing it at all cost, was seen all through his life; and it is worthy of imitation. As a mere tyro in his father’s office, modelling a boat with remarkable precision, as the prince of engineers standing on the deck of the latest triumph of his skill—the “Great Eastern,”

Brunel was still the same careful, pains-taking man. He never shirked hard work, hard physical toil; if circumstances required it, off went his coat, up went his sleeves, and with a will he seized the hammer, or the chain, and laboured like a Titan.

Throughout the construction of the Thames Tunnel, Brunel worked with his father, and did good service. He took his place in the teredos and laboured with the men when any danger threatened, or any unusual difficulty had to be overcome. Twice he nearly lost his life when the water broke in, for engineering is not without its perils; but he was far more concerned about others than about himself, and seemed as much a stranger to fear as Nelson.

In the year 1838, Mr. Brunel, the younger, on his own account undertook the construction of the docks at Sunderland and Bristol, and some extensive tramways in the mining districts. The tunnel was finished, and Brunel the elder had entered the fact in his books with as hearty a "Thank God!" as man ever uttered. While engaged on the tramways the mind of the younger Brunel was directed towards the study of railway

engineering, and as a railway engineer he soon became famous.

It was the beginning of the railway age. Specifications of new plans were accumulating in reams; prospectuses of new companies were being circulated widely; parliamentary committees were fully occupied, far beyond all night-cap time, in discussing the practicability of this, that, and the other line, which should connect Blankdash with Dashblank, or elsewhere. Shareholders were freely investing in scrip; and Capel Court was the focus of railway enterprise; the days of South Sea speculation seemed to have come back again, and everybody had gone stark staring mad on railways. Railways east, west, north, and south; railways leaping over rivers, spanning valleys, tunnelling hills—all the land to be covered from one end to the other with mathematical problems, worked out in up and down lines, sidings, turn-tables, and the like; which turn-tables, as we all know, threw many of the speculators on the down line altogether, with a jail for a terminus. Fortunes were made and fortunes were lost, and the Steam-King reigned potent. But not in the light of fortune making,

or of fortune losing, did Steam-King's prime-minister Brunel regard the railway age. He was enthusiastic, and his enthusiasm was infectious; he rose above all petty considerations of pay and place, and pension; he threw himself heart and soul into the work when appointed principal engineer of the Great Western Railway. The wisdom of his plans, in a commercial point of view, it is not necessary to discuss in this place; as an engineering triumph it is one of the noblest-planned railways in England. Many of its structures, such as the viaduct at Hanwell, the Maidenhead bridge, which has the flattest arch of such large dimensions ever attempted in brick-work; the Box tunnel which, at the date of its construction, was the longest in the world, and the bridges and tunnels between Bath and Bristol, deserve the careful attention of the professional engineer, and are not unworthy of the notice of the architect. They are all, more or less, remarkable and original works, and they all bear evidence of the artistic ability of the engineer.

Mr. Brunel was subsequently engaged on the South Devon Railway, in which he invested the larger part of his earnings, namely, £20,000.

The works on this railway are of extraordinary magnitude; the Albert Bridge over the Tamar, the bridge over the Wye at Chepstow, and the sea wall of the railway, all deserve especial notice as works that do honour to the engineer, to our country, and our age.

Atmospheric railways were regarded by the younger Brunel as practicable and useful adjuncts to steam locomotion. He adhered to this opinion very steadily, although he was opposed in it by many eminent engineers, and lost a large sum of money in endeavouring to carry it out. On the South Devon Railway he adopted the plan—which had been previously tried on the London and Croydon line—but it failed. Notwithstanding this failure, Brunel still entertained a strong opinion that it would ultimately succeed, and who shall say it will not? Engineering science laughs at impossibilities; the wildest dream of to-day is the reality of to-morrow.

We have said that when a mere tyro in his father's office, Brunel tried his hand at shaping a boat. Even then the subject of steam navigation occupied his mind; he completed his model boat, and worked it with locomotive contrivances

of his own. As a marine architect, he subsequently distinguished himself in no ordinary degree. The first steam ship built under his superintendence was the "Great Western." The power and tonnage of the vessel was about double that of the largest ship afloat at that time. He next contrived the "Great Britain," more than double the size of the "Great Western," and the first of the screw steamers. The advantages of the screw were so obvious to Mr. Brunel, that he was indefatigable in his exertions to induce the government to introduce it into the navy. They tried it on the "Rattler" sloop of war, and the whole British navy is now in course of reconstruction.

Everything undertaken by Mr. Brunel was on a colossal scale. His were literally great ideas. His railway the grandest that had as yet been conceived; his ships the most gigantic that have ever floated since Noah's Ark; the "Great Western" was larger than any known ship; the "Great Britain" was still larger than the "Great Western;" last of all came the "Leviathan," a floating city, which was rechristened "Great Eastern." Mr. Brunel had long entertained the

idea that to make long voyages, speedily and economically, vessels should be constructed large enough to carry their own coals for the entire voyage. He entertained also the idea that vessels of a much larger size than any which had yet been constructed might be facilitated with greater ease than ships of smaller tonnage. Hence his firm conviction that the "Great Eastern" would be an immense success.

The story of the "Great Eastern," ends the story of Brunel's life—

"Great was the glory, greater was the strife."

The idea, when it was nothing more than an idea, was ridiculed ; when it became material the difficulty multiplied, and the doubters rejoiced ; there was a long succession of misfortunes, but triumph in the end.

The principle on which the "Great Eastern" was built is what is technically known as the wave principle ; she is wholly built of iron, and her measurement is 23,000 tons ; her length 690 feet ; her breadth 83 feet ; her depth 56 feet. The following description, penned a few days before the launch begun, may be read with interest :—

"Two walls of iron, about sixty feet high, divide the vessel longitudinally into three parts; the inner containing the boiler, the engine-room, and the saloons, rising one above the other, and the lateral divisions the coal-bunkers, and above them the side cabins and berths. The saloons are sixty feet in length, the principal one nearly half the width of the vessel, are lighted by skylights from the upper decks. On either hand are the cabins and berths; those of first-class passengers being commodious rooms, large enough to contain every requirement for the most fastidious landsman. The berths of the crew are formed below the forecastle, which is devoted to the officers. Below the berths of the seamen are the enormous cavities for cargo, of which 5000 tons can be carried, beside coals enough for the voyage to Australia, making about as many tons more. The weight of this huge ship being 12,000 tons, and her coals and cargo 18,000 tons more, the motive power required to propel her twenty miles an hour, must be proportionate. If the visitor walks aft and looks down a deep chasm near the stern, he will perceive an enormous metal shaft 160 feet in length, and weighing sixty tons;

this extends from the engine-room nearest the stern to the extremity of the ship, and moves the screw, the four fans of which are of proportionate weight and dimensions. If he walk over and look over the side, he will see a paddle-wheel considerably larger than the circle at Astley's, and when he learns that this wheel and its fellow will be driven by four engines, having a nominal power of 1000 horses, and the screw by a nominal power of 1600 horses, he will have no difficulty in conceiving of the rapidity of a voyage to America or Australia. The screw-engines are by far the largest ever constructed, and when making fifty revolutions per minute, exert an effective force of not less than 8000 horses. The four cylinders weigh about twenty-five tons each, and are eighty-four inches in diameter. The crank-shaft, to which the connection rods are applied, weighs about thirty tons. The boilers are six in number, having seventy-two furnaces, and an absorbent heating surface, nearly equal in extent to an acre of ground. The total weight exceeds 1200 tons, and yet they are so admirably contrived that they can be set in motion or stopped by a single hand. The ship is constructed with

seven masts, two square rigged, the others carrying only fore and aft sails. The larger masts are iron tubes. The funnels, five in number, are constructed with double castings, and the space between the inner and outer castings can be filled with water, which answers the double purpose of preventing the radiation of heat to the decks, and of economizing coal by causing the water to enter the boilers in a warm state."

The construction of the ship was no less novel than the mode devised for her launch. As her immense length rendered it impossible to launch her in the usual manner, that is to say stern foremost, she was built lengthwise to the river on cradles. These cradles were of enormous strength, and were made to traverse on a double series of ways, each 120 feet in breadth. The ways were 300 feet in length, with an incline of one in twelve.

The tackle by which the ship was to proceed into the water was rather complicated, and gave much trouble to the engineers. At the stem and stern were placed a powerful hydraulic ram to give the first start, and when the ship was once in motion, her progress was to be kept up in the

following manner:—On the river side four large lighters were moored in the tide way, and were to work by means of chains fastened to the vessel amidships. Two lighters were also moored at the stem and stern of the vessel, the chains passing from the ship to them; the latter were again to be passed ashore, and thus work with a double purchase. In order to prevent the vessel dashing too hastily into her “native element,” two powerful drums were constructed, to which the cradles were attached, and by which the progress of the vessel might be instantly stayed, should it exhibit symptoms of a too hasty plunge.

On a November day thousands of people flocked to see the “Leviathan” take to the water; shoals of small craft covered the river; scaffoldings erected on every available spot were thronged with anxious sight-seers; the banks of the river—every “corner of vantage” was occupied; the men of science gathered strong; and Miss Hope (auspicious name) christened the ship with a sprinkling of good red wine. Then, amid the cheers of the multitude, the lighters began slowly to haul taut the tackle, but they made no impression on the ship. Suddenly she slipped, there

was a frightful accident, a dull, dead stoppage again, and no more movement that day. Again and again for many days the operations of the launch were steadily and perseveringly pursued; numerous hydraulic machines were borrowed and fixed, fresh tackle applied, and many novel and ingenious expedients adopted. It was thought necessary to await the next spring tides, in order that the monster—so tenaciously clinging to the mud bank, and leaving frantic shareholders to pay for her lodging, might, when she reached the water, find sufficient depth to float her. It was a weary anxious time! the capricious ship sometimes slipping a few inches of her own accord; sometimes resisting all attempts to move her; but finally she was brought down the ways until she was immersed in the water to the depth of eight or ten feet; then lastly, she was got off, and was towed away to be fitted up for her first voyage.

The fatigue and mental strain caused by his efforts to see the completion of the "Great Eastern," accelerated the death of her engineer. For several years Mr. Brunel had been suffering from ill-health, brought on by over-exertion. He

allowed himself no relaxation from professional labours. He completed some of his greatest triumphs in a condition of physical prostration painful to witness. He was nothing daunted by difficulty; nothing dismayed by danger; not to be baffled by sickness, nor afraid of death; strong in the consciousness of his own rectitude, and with a religious devotion to his profession, he persevered where others would have hesitated, advanced where others would have stopped, triumphed where others must have failed. It has been noticed that the commercial success of many of his great undertakings was not answerable to the greatness of their conception. "Success and failure were on his right hand and his left. Success in the line of inventive art, failure in the result of reproductive art. Unlike Stephenson, who made everything pay, Brunel made nothing pay. As an engineer, he raised the mightiest works and ruined the richest men! The Great Western Railway and the 'Great Eastern' steamship—the best line of railway in the world and the noblest steamship afloat; both the most glorious growths of a scientific intellect, have had the same melancholy result of swamping

the fortunes of those who engaged in them. The engineer won renown and the shareholders lost their money." But however true this may all be to a certain extent, it must not be accepted without a grain of caution. We are too apt to judge of results before results can be satisfactorily ascertained. Brunel planned the suspension bridge for Clifton, a light and graceful work ; it did not pay ; it could not be erected ; it was a failure ; and the failure at Clifton was a success in London, and in the Hungerford Suspension Bridge, spanned the Thames, and mocked at the Clifton Company. *But*, Clifton has received her bridge, and the failure is not a failure after all. Let us wait awhile before we cry failure. Is the Great Western Railway a failure ? Is the "Great Eastern" a failure ? Let us be in no hurry to answer these questions ; let 1880 answer them ; the reply will then be far more satisfactory.

A writer in the *Quarterly Review* has remarked that although Brunel died at the comparatively early age of fifty-three, it is even matter of surprise that he lived so long. He had more perilous escapes from violent deaths than fall to the lot of most men. At the outset of his career, when

acting as assistant-engineer to his father in the Thames Tunnel, he had two narrow escapes from drowning by the river suddenly bursting in upon the works. Some time after, when inspecting the shafts of the railway tunnel under Box Hill, he was one day riding a shaggy pony at a rapid rate down the hill, when the animal stumbled and fell, pitching the engineer on his head with great violence ; he was taken up for dead, but eventually recovered. When the Great Western line was finished and at work, he used frequently to ride upon the engine with the driver, and occasionally he drove it himself. One day, when passing through the Box tunnel upon the engine at considerable speed, Brunel thought he discerned between him and the light some object standing on the same line of road along which his engine was travelling. He instantly turned on the full steam and dashed at the object, which was driven into a thousand pieces. It afterwards turned out to be a contractor's truck which had broken loose from a ballast-train on its way through the tunnel. Another narrow escape which he had was on board the "Great Western" steamship, where he fell down a hatchway into the hold, and was nearly killed. But the most extraordinary acci-

dent which befell him was that which occurred while one day playing with his children. Like his father, Sir Mark, he was fond of astonishing them with sleight-of-hand tricks, in which he displayed considerable dexterity; and the feat which he proposed to them on this occasion was the passing of a half-sovereign through his mouth out at his ear. Unfortunately, he swallowed the coin, which dropped into his windpipe. The accident occurred on the 3rd of April, 1843, and it was followed by frequent fits of coughing, and occasional uneasiness in the right side of the chest; but so slight was the disturbance of breathing, that it was for some time doubted whether the coin had really fallen into the windpipe. After the lapse of fifteen days Sir B. Brodie met Mr. Key in consultation, and they concurred in the opinion that most probably the half-sovereign was lodged at the bottom of the right bronchus. The day after Mr. Brunel placed himself in a prone position on his face upon some chairs, and, bending his head and neck downwards, he distinctly felt the coin drop towards the glottis. A violent cough ensued, and, on resuming the erect posture, he felt as if the object again moved downwards into the chest. Herc was an engineering

difficulty the like of which Mr. Brunel had never before encountered. The mischief was purely mechanical ; a foreign body had got into his breathing apparatus, and must be removed, if at all, by some mechanical expedient. Mr. Brunel was, however, equal to the occasion. He had an apparatus constructed, consisting of a platform which moved upon a hinge in the centre. Upon this he had himself strapped, and his body was then inverted, in order that the coin might drop downward by its own weight, and so be expelled. At the first experiment the coin again slipped towards the glottis, but it caused such an alarming fit of convulsive coughing and appearance of choking that danger was apprehended, and the experiment was discontinued. Two days after, on the 25th, the operation of tracheotomy was performed by Sir Benjamin Brodie, assisted by Mr. Key, with the intention of extracting the coin by the forceps, if possible. Two attempts to do so were made without success. The introduction of the forceps into the windpipe on the second occasion was attended with so excessive a degree of irritation, that it was felt the experiment could not be continued without imminent danger to life. The incision in the windpipe was,

however, kept open by means of a quill, or tube, until the 13th of May, by which time Mr. Brunel's strength had sufficiently recovered to enable the original experiment to be repeated. He was again strapped to his apparatus; his body was inverted; his back was struck gently; and he distinctly felt the coin quit its place on the right side of his chest. The opening in the windpipe allowed him to breathe while the throat was stopped by the coin, and it thus had the effect of preventing the spasmodic action of the glottis. After a few coughs the coin dropped into his mouth. Mr. Brunel used afterwards to say that the moment when he heard the gold piece strike against his upper front teeth, was, perhaps, the most exquisite in his whole life. The half-sovereign had been in his windpipe for not less than six weeks.

But the man whose life had been so singularly preserved, succumbed at last to hard work. He died surrounded by admiring friends, full of honour. He had excited no professional jealousy; grieved no man by assumption; lost no friend by word or deed of his; a good man, with his heart in the right place; a heart as warm as his intellect was clear.

MARSHALL HALL :**THE PHYSICAL ENTHUSIAST.**

DR. MARSHALL HALL was born at Basford, near Nottingham, on the 18th of February, 1790. His father was a cotton manufacturer, following in the wake of the Arkwrights, Peels, and others of similar celebrity, being contemporary with the Strutts in the early period of the cotton manufactures. He was the inventor of a new method of bleaching, which for a time brought him into ridicule and contempt, the place of his experiments being denominated "Bedlam;" but after awhile the Bedlamites triumphed over ignorance and prejudice, and the method introduced was universally adopted, with immense success. Mr. Samuel Hall, second son of his father, distinguished himself likewise by many useful inventions, among these may be mentioned the cleaning of lace or net, by passing it over a fine flame of gas impelled by an air-pump; the consumption of smoke furnaces;

reefing and unreefing of paddles, wheels, etc., which, as Lord Derby says, includes a great deal.

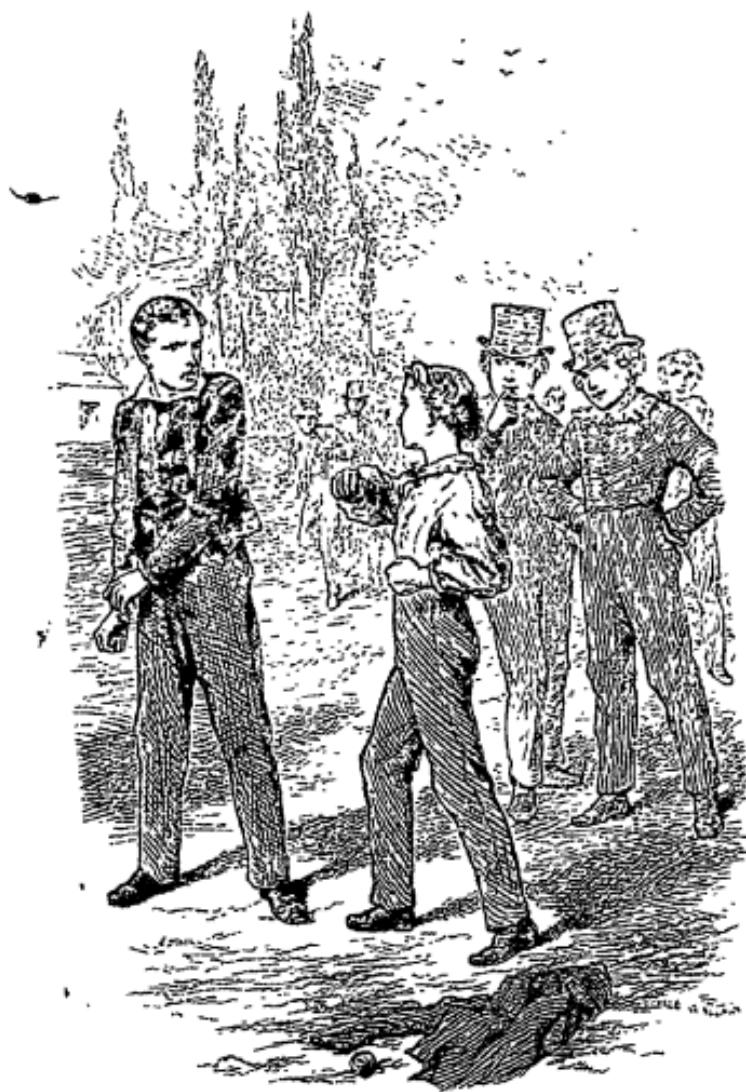
Marshall Hall was the sixth of eight children. When he was about four years old, he suffered from a severe illness, which is said to have retarded his growth; recovering from this, he became active and lively; "an affectionate and obedient boy," his mother used to say, "who never caused his parents any sorrow." Whilst yet a child, he went to his father's bookkeeper one day, a Methodist, mighty in the Scriptures, and propounded this theological query:—"Is hell under the sea?" The answer is not recorded; probably the bookkeeper was short of information on the subject, but the question was pertinent. "Because if it is," said the boy, "I have been thinking that if we were to bore some holes in the bottom of the sea, and let the water through, we might put the fire out!" It was an original suggestion of a physical enthusiast that had a practicality about it, supposing

He was very fond of books; for him they had a peculiar attraction, even in his earliest years, before the printed characters were anything to him but so many strange forms, forms of occult

meaning that to the initiated were instinct with life; when he knew how to read, had mastered—let us say what we may of it, most difficult of all acquirements—a knowledge of the alphabet, and spelling words, he spent much time at his favourite volumes, reading of Pilgrim on his way to the Celestial city; of the perils of the road, its temptations, and its trials; of Jack, the sturdy little hero and mighty foe to giants; of Robinson Crusoe on his desert isle with his man Friday; of Sinbad the sailor's singular adventures, and all the thousand and one stories of the Arabian Nights. What a world of enchantment these books presented to the boy, only those who can recall their own childish delight at their perusal can at all estimate. But of all the wonderful books he read, none made so deep an impression on his mind as the Holy Scriptures. He read the Bible attentively. Not that he was a precocious saint, who would answer, at three and a-half years old, that he found inestimable comfort from the fifth of Romans; he read it with a reverence such as belongs to a child's mind when first brought face to face with truth—with God. We may fancy how strangely that youthful face was moved by

emotion as the eye scanned the page of inspiration ; the wonderful story of God's wonderful way with man in the world ! And then God's other Bible was open to him : all nature, the sky and earth, the stars and flowers ; and he began to read that book very early, finding "tongues in trees and sermons in stones."

At an early age he was placed in the academy of the Rev. J. Blanchard, at Nottingham. There he applied himself diligently to study, and soon acquired a reputation not only for application but for spirit and courage. He hated oppression, was as stout-hearted a foe to tyranny as ever in a fabulous age drew sword upon a dragon. There was a bully boy in the school—in what school is there not?—a big lump of a fellow, with more body than brains, and who set himself as dominant master of the playground. He was a despot, and the boys feared him, for his hand was heavy and mayhap he wore thick boots. Now Marshall Hall knew well enough there was only one way of dealing with this autocrat—he must be thrashed ; and so he went in a fair stand-up fight, little one with Right as his backer, against big one with Wrong for his bottle-holder, and beat him soundly. This



MARSHALL HALL AND THE BULLY.

"The little one with Right on his locker, against the big one with Wrong as his
bottle-holder."—Page 294.

was a great victory ; how it was looked upon by the clerical tutor we are not informed, but with the boys Marshall Hall was a hero.

At the age of fourteen he was taken from school, and at fifteen read with intense delight Dr. Watson's celebrated Chemical Essays, following up the subject by a study of the works of the unfortunate Lavoisier. About this time he was placed with Mr. Moore, a chemist of some repute and wealth, at Newark. There he learned Latin, and taught himself the flute. He was a diligent student in all that he undertook. A great economist of time ; he never allowed anything to baffle him which could by perseverance and patience be overcome. Latin he was most anxious to acquire, and he triumphed. But it must be remembered that he did so under many disadvantages, which self-instructed students of the present day know nothing of. There was no easy road to learning ; no books specially prepared for pupils without a master ; it was downright hard work to conquer Latin then.

In 1809 he repaired to Edinburgh for the purpose of preparing himself for the career of a physician. He entered on his new sphere with

eculiar ardour and enthusiasm, and his whole conduct was so exemplary that an eminent medical practitioner at Nottingham requested him to allow his son to share his lodgings, that he might benefit by his example. His favourite study was chemistry, but he was deterred from too exclusive an attention to that subject, by a remark made to him by Dr. Balcombe of York, "I never knew a great chemist make a good physician." This idea lodged itself in his mind, and never left it. Chemistry was no doubt useful, but his ambition was to be a great physician. He had looked upon man "fearfully, wonderfully made," and he wanted to become thoroughly familiarized with all that concerned him. On this subject he was enthusiastic. Poets, and painters, and musicians become inspired, as it were, by the themes which occupy their attention ; the happy turn of periods, the agreeable arrangement of colour, the glorious harmony of sound, lift them above earth and things earthly. They are permitted to be enthusiastic ; why should not a man be an enthusiast in science ? Is there no poetry, no harmony in anatomy and physiology ? Nothing to absorb the human intellect, and elevate, and refine it in a careful study

of the laws of health and happiness? Surely there is enough to awaken enthusiasm in the body of man, the last work of the Divine Architect! Surely it is something to detect the lurking enemy, disease, in the secret penetralia of the body; something to baffle disease, and defeat, for awhile, the fell-destroyer, Death. Marshall Hall felt it to be so, and he gave himself heart and soul to the work.

We have said that he was an economist of time, and the following table, found among his loose papers, testifies to that fact.

“ 1. To spend two hours in the morning in dissection and in the study of operations.

“ 2. Then two or three hours in the wards of the hospital, inquiring particularly into the history, symptoms, treatment, and effect of remedies on each patient, but especially making a particular study of *diagnosis*.

“ 3. The plan of studying diagnosis:—

“ (1.) The formation of a diagnostic arrangement for bringing together those diseases, which being most similar, are most apt to be continually mistaken; and

“ (2.) The collection of diagnosis from every

source of distinction, in the history, symptoms, causes, effects of remedies, etc., etc.

“ (3.) This plan embraces all diseases, medical, surgical, puerperal, etc.

“ 4. To go through a course of study comprising chemistry, physiology, and *materia medica*, in as practical a manner as possible.

“ 5. To study the Latin and French languages, reading Celsus, *Heberden*, and *Gregory*; *Corvisart*, *Chardél*, *Pinel*, *Dessault*, *Bîchat*, etc.”

And so he persevered; studying diligently, working laboriously. He indulged in no amusement beyond that which his profession afforded; he turned his attention to no study but what bore directly or indirectly on his favourite pursuit; he never appeared so happy as when descanting on the laws of health, the diagnosis of disease, the art of medicine; he never trusted to second-hand information; never availed himself of easy helps; never patronized “a grinder.” Night and day he worked so, that it was said of him, “Hall never tires.” “Hall has found out how to live without sleep.” He joined a society, embracing among its members many a man whose name subsequently became distinguished in the annals of

science, and there his appearance invariably attracted notice. “Where is Hall?” was sure to be the inquiry, if he was absent. “There is Hall!” sure to be the comment when he appeared. Never during the whole three years of his medical course did this man ever miss a lecture. No doubt many of these lectures were tedious enough to a man of his active, ready mind, but he never flinched on that account; if only a few grains of corn were to be found, he would put up with a bushel of barn-sweepings. For about two years after the completion of his three years’ course, Hall was associated with the Royal Infirmary, thus spending altogether about five years in Edinburgh. In his letters he intimates that the fees were a little heavy—heavy for a light purse; but his personal expenses were always small; he lived frugally, and wrote of his lodgings, “I don’t think they are dear.”

In 1814 Marshall Hall took leave of the Scottish capital, and availing himself of the friendly invitation of a brother “medicine man,” started for Paris. He spent a few weeks in that gay, splendid city, and was particularly delighted by all he saw. The hospitals and medical schools

attracted a large share of his notice, and he expressed himself concerning them in very favourable terms. From Paris he made a pedestrian tour to Göttingen, a distance of about six hundred miles ; there he made the acquaintance of the venerable Blumenbach, and forgot the fatigues and perils of the way in the enjoyment of that great and good man's society. These perils were neither few nor small, for the road over which Hall had to travel, and he travelled on foot, had recently been the scene of desperate conflict ; the law was the law of the strong hand still, and purse and life were endangered by every step.

On returning to England in 1815, Dr. Hall determined to set up in business. He had a strong wish to establish himself at Nottingham, but in that good city there were already four physicians ; enough and to spare, he thought, to undertake all the probable practice that would fall to a physician's care. He accordingly waved his original design, and established himself at Peterborough. There, however, he resided but six months, finally coming to Nottingham, and finding practice not so bad as might have been expected.

It was about the time of his removal to Not-

tingham that he completed and published his famous work on diagnosis. This subject which, as he himself remarked, is everything in the medical profession, was the foundation of all his success. The accurate distinction of one disease from another was what he kept steadily in view in all his practice, and all his researches. He would listen with amazing patience to the most minute details of suffering. He had nothing in common with those sons of *Æsculapius*, who suggest sensations to their patients, and make up a case as a lawyer would do in *nisi prius* practice. He never rejected a novel symptom; he would simply investigate, putting such leading and pertinent questions as elicited the whole truth. He would never, if he could help it, listen to symptoms detailed by any one but the sufferer. "Let the patient tell his own story," was his invariable request, and the successful result of his treatment is in a large measure traceable to this method. To look at the tongue, to feel the pulse; to ask of appetite, sleep, and digestion, How were they? never satisfied him; he made himself acquainted with all the delicate variations of a disease, and was never annoyed with a patient (as some doctors

are) for not having a pain which, according to all precedent, they ought to have ; or for being troubled with a symptom which was never recognized by any writer on pathology. Thus Marshall Hall stood before the world in every respect an original man—a man of undoubted genius, who dared to think freely, and to express himself boldly, even at the risk of never earning a fee for a shake of the head, and “I thought so !”

Hall’s book on diagnosis created an immense sensation. Soon after its publication he came to town and called on Dr. Baillie. The doctor freely entered on the subject, and complimented the young man on “his father’s book.” Hall modestly corrected the mistake, and described himself as the author. This announcement astounded the Doctor, how was it possible so young a man could write so great a book !

Meanwhile Hall’s practice was rapidly increasing, he was in great request ; he was consulted in very difficult cases, and almost always with success. He was a rising man, patronized at the “Dukeries ;” but though not blind to the advantages of strawberry-leaf shelter, he chiefly cultivated his practice among the middle classes.

Some cases he refused to have anything to do with. He used to say "Send for So-and-so;" "This is in So-and-so's line;" "So-and-so will do it better than I." His extreme delicacy in points of professional etiquette was proverbial. When called in to consult with the family adviser, it was his rule to hold no private communication with any member of the family; to express his opinion on the case to the medical attendant only, to enter the house last and leave it first.

One of Dr. Hall's earliest reformatory efforts in medical practice was directed to the lessening of the amount of blood-letting which then prevailed among practitioners. They bled for everything; the lancet, the leech, and the surgical cup were in constant request. A patient in one of our hospitals was bled seventeen times in the course of one day; there was a mania for bleeding, as strong as that which prevails among Italian doctors at the present time, perhaps stronger. The healing art consisting in reducing the patient to death's door (which he often passed), and then building him up again with cordials, strong nourishment, strengthening mixture; every pain, every symptom of excitement in brain or

heart was traced at once to too much blood, and bleeding was the cure. Hall set himself steadfastly in opposition to this wholesale bleeding. He did not forbid it altogether; did not bid the practitioner throw aside his lancet for ever; but he laid down principles which save all who follow him from either excess or deficiency in the use of this remedy.

While preparing his various works on medical science, Hall was actively engaged in his professional duties. He was not a closet theorist; all that he wrote was the result of practical experience. It is said that his book on diagnosis was written, as it were, by the bedside of his patients. It abounded in the facts which came under his own immediate observation, and facts, as he used to say, with a word or two of comment, leave an impression of truth on the mind which is at once clear and enduring. So careful and minute were all his observations that no symptoms escaped him. When he was making, in the latter years of his life, a voyage to the United States, he suffered frightfully from seasickness; but notwithstanding his own prostration, he continued to make notes of his sensations

—as he did in his last illness—and produced in consequence a paper on the Physiology of Seasickness. So ardent an enthusiast of physical science never tired. He rode swiftly; he was fond of horses and of equestrian exercise; and when somebody wondered that his horses never fell, he answered, jestingly, “I never give them time to fall.”

A physician of so much ability could not long remain in the country. Hall came to London. He left his residence suddenly, and wrote to his brother-in-law to sell off his house and furniture, as he intended to settle in the metropolis. He practised in London for twenty-seven years, and his annual income rose from eight hundred pounds to four thousand. But he was not a man who valued money; he had a great distaste for things pecuniary; he left bills and checks, bank notes and bullion carelessly about, perhaps the only thing in which he ever was careless.

In the life of a thriving London physician there appears to be no very great interest; and the quiet life which Dr. Hall invariably led, would certainly make no exception in his case. He used to say that the best cordial was cheerfulness,

the best tonic happiness, and he followed his own prescription. A happy, cheerful man, enthusiastic in his profession, remarkably successful, holding an excellent social position, such was Dr. Hall; but yet his bed was not altogether made up of roses. He had many admirers and warm supporters, but then he had many opponents, brother medical men, who looked upon him with distrust, who felt no sympathy with his enthusiasm; men who were tied down by the red tape of professional routine, and could never disentangle themselves from its thrall. The more extensively Dr. Hall employed his great ability in physiological research, the more hostile became the attack of his opponents, so that he often said that he would appeal from the first half to the last half of the nineteenth century.

Writing, experimentalizing, visiting, noting down data for future investigation, exploding old errors, discovering new truths—so passed the life of this physical enthusiast. See him standing, as though overwhelmed by a great thought, as a decapitated triton convulsively twitches its limbs as his needle touches its nervous system; hear him expounding in aphoristic form his theory to

Bransby Cooper, "The arteries divide, divide, divide; the capillaries divide, unite, divide, unite; the veins unite, unite, unite." Watch him after his frugal meal of mutton and rice-pudding, turning up his wristbands for an evening's experiment, and hinting that he would like a cup of tea as soon as possible: a very unobtrusive man, of simple habits; not to be hooted at as a quack, and run down like a mad dog!

Hall was a discoverer, and he had to bear the brunt of ignorance and prejudice. What discoverer can hope for exemption? The great discovery of this man's life was the true spinal system of nerves. It had been suggested by the convulsive movements of the dead triton; it was worked out, fairly elaborated, by research and experiment. He discovered the true physiology of the spinal marrow, with its complete and beautiful illustrations of the laws of life and disease, together with its practical application to medicine. The discovery entitles him to rank with Harvey, Hunter, and Jenner. All he undertook had a practical tendency; this most of all. But it was that which gave the gravest offence to the faculty in general. They would hear nothing of it; all that was necessary to be known

was known; the confines of medical science had been distinctly marked; no rash meddler must be allowed to disturb the recognized principles approved of by the College of Physicians! When the discovery came to be known it was boldly asserted to be no discovery at all! Then it was a gross plagiarism; the discovery was as ancient as the father of medicine; it had been stolen without acknowledgment from Prochaska! It is not surprising that he should feel keenly the attacks made upon him—the insidious slander, the open insult, the bludgeon blows, and keen stiletto stabs of the medical press. He did feel it deeply. So felt Harvey, so felt Jenner, so every benefactor to the human race has felt, when the hands of ignorance and prejudice have been uplifted to stone the prophet, because he told them the truth. One is reminded by these things of Paccheo's verses on art;—

"A daubing dunce had limned a cock,
When, lo! brave chanticleer came by,
As if to give his brush the lie,
And the fool's ignorance to mock.

"But want of skill the man supplied
In one well-aimed and vengeful knock;
And so the unoffending cock,
Fell, martyred to the truth, and died."

But the genius and originality of Marshall Hall suffered no such hard fate as this. When a boy at school he beat the big bully, and the "child is father of the man." Quiet, unobtrusive, earnest student as he was, he knew how to defend himself, how to defeat and humiliate arrogant assumption. In the face of all that could be uttered against his system, he multiplied his experiments, continued his researches, defended the truths he had already established, and step by step, surely and clearly, developed the beautiful system of the spinal nerves. No other man since Harvey has impressed himself so strongly on our medical literature and practice. Prejudice and opposition were at last overcome, and he lived to enjoy the full recognition of his merits. On the continent, and in America, his works and discoveries elicited unbounded admiration. Scientific societies vied with each other in bestowing upon him their choicest honours. The Membership of the Institute of France he valued pre-eminently, because "no second-rate physiologists were ever admitted there."

The last subject which engaged his active mind was that of asphyxia, undertaken with a

view of promoting the benevolent objects of the Royal Humane Society. His experiments resulted in the well-known "Ready method," or "Marshall Hall method," of restoring animation to the apparently dead or drowned. This likewise met with much opposition, and was at first received with much distrust by the Royal Humane Society itself. It has been objected that this method begins with expiration instead of inspiration; but by the reasons already given, in favour of beginning the process with pronation, the objection is more than answered: for if you start with inspiration, you may draw fluid into the lungs; whilst, on the other hand, if you start by promoting expiration, you open the glottis, clear the air passages of fluid, and get rid of some of the poisonous air before the pure is inhaled—three great points gained by a single movement. Having thus, by this prone and prostrate position, enabled air to enter the lungs under the most favourable circumstances, we can turn the body on the side, and observe whether any sign of life exists, any breathing or gasping. If it appears that feeble breathing *does* exist, or has recommenced, we may proceed to excite it till

the breathing is freely restored ; but if no sign of breathing be manifested, then we at once proceed mechanically to *imitate* the acts of respiration."

Among other subjects which engaged the active and able mind of Dr. Hall was the sewerage of London and other large towns. He detected, and very clearly pointed out the radical evils of the system which at that time prevailed. Here again, he was of course opposed, but his suggestions have subsequently been extensively carried out, and our metropolitan sewerage will yet unquestionably become what Marshall Hall declared that it ought to be many years ago.

In 1853 Dr. Hall paid a visit to the United States, and was everywhere well received. On his return to England his health, which had for some time been impaired, manifested alarming symptoms. He was attacked, after lecturing, by what is sometimes called the clergyman's sore throat, and the affection became rapidly worse. It is unnecessary to trace the progress ; it was long and painful ; but he bore it with the fortitude of a Christian ; his heart stayed upon that Great Physician who is touched with the "feeling of our infirmities."

In the course of our brief sketch we have scarcely alluded to the earnest, deep, thoughtful religion of Dr. Hall. He was a Christian; his text-book of life the New Testament, his earnest effort to live near to Christ, and his highest hope to be with Him. There was something, it is said, touchingly beautiful in the radiant expression which would come upon his face when his friends offered to read the Bible to him. Yes; it was the book of books to him, through which, as through a window, he could look up and discern his celestial home. Some lines in a volume of poems lent to him by a friend particularly pleased him, and he transferred them to his note-book:—

“Life, we've been long together,
Through pleasant and through cloudy weather;
'Tis hard to part when friends are dear,
Perhaps 'twill cost a sigh or tear.

Then steal away, give little warning,
Choose thine own time,
Say not Good night, but in some bright clime,
Bid me Good morning.”

That “good morning” was given on an August day, 1857; and so the good man went to his reward, where “the wicked cease from troubling, and the weary are at rest.”

THOMAS DICK:

THE CHRISTIAN PHILOSOPHER.

AMONG our untitled nobility the late Dr. Thomas Dick merits a place. He was not born great, nor did he achieve greatness, nor had he greatness thrust upon him; but he led a brave life and accomplished a good work; and now that he rests from his labour the result of his work is still felt in the world.

Such men as Dr. Thomas Dick, from their unassuming character and the modest nature of their toil, are too frequently passed over without notice; the obscurity which encomplices them never pierced; all that the world esteems honourable given to more conspicuous men, who have certainly done more for *themselves*, but less for their fellows, than the quiet writer or persuasive speaker who simply utters the truth truthfully, and is as strange to clap-trap as to fraud.

Thomas Dick was born just ninety years ago,

and was trained for the ministry of the Scottish Secession Church. It was the earnest desire of the man's soul to speak God's truth ; he felt, who shall say how deeply, the responsibility of speaking to one's fellows of God, and heaven, and the life everlasting. Precious to him was the sacred volume ; he loved it as a child, with a child's love, and clung to it with the same warm affection to the end : it was the book of books to him ; the lyre which yielded sweetest harmony, thrilling with the music of the skies. But the young student could not close his eyes to the beauties of nature, could not close his ears to the voice of conscience, could not remain indifferent to God's works while he clung so tenderly to God's Word. It was not enough for him to know what rigid churchmen had written and endorsed as to God's way with man in the world. No man valued more highly the labour of the divines, or was more stedfast in the advocacy of the old truths for which heroes and martyrs shed their blood ; but he loved nature, and sought to penetrate the arcana of science from stars, and stones, and flowers, to gather the comfortable conclusion, “ My Father made them all.”

Men, thoughtful men, *will* be wise above what lies written in church articles, and catechisms, and digests of divinity; the sapphire sea of truth stretches before them, and they long to explore what is beyond. They are not afraid to investigate, lest haply they should discover too much for their faith; they are not afraid that religion will suffer from ventilation; they believe in the light, and come to the light both in sacred and natural philosophy. It is painful to reflect that there are many good men who still set their face steadfastly against science. George Wilson shed tears when a Scotch minister prayed for him "as a chemist." He knew well enough that a large number of orthodox people were doubtful of the religion of a chemist! Seventy years ago these matters were worse than they are now. People had gravely shaken their heads at Newton, and were alarmed lest Christianity should sustain some serious injury from her best handmaids, Science and Art. It was just the season when a youthful preacher, of vivid imagination and powerful intellect, would be narrowly watched. Thomas Dick soon ascertained that his scientific bias was looked upon askance; that the fathers

of the church were of opinion that a preacher of the Gospel need trouble himself nothing about earth or skies; that the world was to be converted by the "foolishness of preaching," too frequently understood as if foolish preaching were intended; and what could the young man do? He had preached with some success, but there seems to have been too much nature in his sermons to please his hearers; his attachment to physical science was too strong to be overcome, for to him it was a part of his religion; and so the first trials of his life began. He resigned the profession for which he had been educated, and sought to earn a living by his pen.

There is something admirable in conscious self-sacrifice. When, for conscience sake, a man gives up a certain living and betakes himself to a more precarious mode of life, there is, and must be, an earnestness in the man's soul that is worthy of respectful homage.

Thomas Dick was convinced that the time had arrived when men should throw aside old prejudices, and receive scientific truths as God's truth—not in any sense repugnant to revelation. He held that this should be made clear to man.

"When I consider the heavens, the work of Thy fingers, the moon and the stars, which Thou hast ordained; what is man that Thou art mindful of him?" The Psalmist was not afraid to admire God's work, and how much would his adoration have been increased had he known the vastness and grandeur of the universe! We only properly admire what we understand; and so, in the spirit of a truly Christian philosopher, the young student set himself to the work of making God's work and God's Word familiar; illustrating by tongue and pen, by lectures, and by books, and occasional sermons, the harmony that exists between them.

It was a necessary work. The doctrines of materialism were being widely embraced. Scepticism was erecting batteries of physical science with which to destroy the strongholds of spiritual religion. The ministers of the gospel were, for the most part, unwilling to do battle, though with the certainty of turning their own guns against the foe; they preferred to deal in wholesale charges of infidelity, in positive assertions; to take up untenable positions; to awaken contempt by the display of ignorance; until they made the cul

tivators of science feel, as one says, very much as a good Greek scholar would, who should read a severe critique upon the style of Isocrates or Demosthenes, and before he had finished the review, should discover internal evidence that the writer had never learned the Greek alphabet. And setting himself stedfastly to the work, Thomas Dick began to show the world, consistently and clearly, that science and Scripture were as one; that there was no contradiction, no antagonism, between God's Word and God's work—that they both spoke the self-same language of wisdom, goodness, and power. The books of this patient, unobtrusive, painstaking Scotch parson came before the public, were read and praised, and wakened up in the souls of many new and better feelings than had been there before. These books are well known—the *Christian Philosopher*, the *Philosophy of Religion*, the *Philosophy of a Future State*, the *Mental Illumination of Mankind*, *Celestial Scenery*, *Sideral Heavens*, *Practical Astronomy*—they are all conceived in the same spirit and breathe the same devotion for the Divine Architect.

Popular as the books of Thomas Dick were, they brought but small profit to their author.

He had to eke out his living as best he might with lecturing and magazine work, and the rest of it—a battle for bread, bravely fought for many a long year. There were no honours for him, or such as him; others, of infinitely smaller worth, carried off the prizes, won the applause; the Christian student was too modest a man to find the way to fortune. And so he grew old; the only public reward he received being a doctorship, very fairly earned; and with poverty for his gentleman-usher, managed to live on a very scanty income. A subscription for his benefit was set on foot, but it made little progress; the condition of the poor author elicited but small sympathy and less cash. The Americans were far more liberal than his own countrymen, and have not forgotten to mention the same in every brief notice of the student's life. A small pension was at length granted to him—a pittance on which to keep the wolf, hunger, from the door. At a cottage at Broughty-Ferry, on the banks of the river Tay, he lingered out the remnant of his life. He died in August 1857, aged eighty-three; and paragraphs of two or three lines marked that event in the literary papers.

A plain unvarnished tale like the life of Dr. Thomas Dick, furnishes but little encouragement to those who seek the good things of this world for their reward. But there is a better reward than can be given by human consent, better than a distinguished place in society and handfuls of pelf; there is the consciousness of having done good work in the world, of a rightful employment of talents bestowed, of a life well-spent. What are the largest fortunes, the highest titles, the costliest mausoleum, in comparison with the "Well done!" of the Master?

HENRY CORT:

THE STORY OF AN INVENTOR.

How shall we characterize our age? It is not an age of innocence, our criminal courts settle that point; nor an age of gold, notwithstanding all our auriferous discoveries; nor an age of chivalry, that sublime and beautiful idea went out with Burke; but we think it may fairly be called an age of iron. With iron hands we labour, with iron feet we walk, with iron fins we swim, with iron wings we fly; we are men made of iron (like Charlemagne's warriors); our ships are iron, our lighthouses are of iron, our bridges of iron, our carriages of iron, our roads of iron, even our houses and churches of iron; with iron we plough, and sow, and reap; with iron convert the golden corn to flour; with iron, in the shape of sword and bayonet, and iron walls, defend our fields; we send messages—words of love or hatred, welcome or defiance—by a subtle mercury on iron wires:

iron everywhere—dead iron made alive with the breath of steam !

“ While through a forest Tubal (with his yew
And ready quiver) did a boar pursue,
A burning mountain from his fiery vein,
An iron river roll’d along the plain.
The witty huntsman musing hither hies,
And of the wonder deeply ’gan devise.
And first perceiving that this scalding metal
Becoming cool in any shape would settle,
And grow so hard, that from his sharpen’d side
The firmest substance it would soon divide ;
He casts a hundred plots, and yet he parts,
He moulds the groundwork of a hundred arts.”

But everything on the earth or under the earth requires to be brought forth by man. Human brain-sweat and brow-sweat must be wrung from quivering muscle and from aching head, before nature will yield her store. “ God gives every bird its meat, but He does not throw it into the nest.” The history of iron is closely associated with the history of civilization, and iron has been worked in England from an early date. The early iron trade was at its greatest height in 1615, when, according to “ Sturtevant,” as quoted by Dudley in his “ *Metallum Martes*,” there were in England, Scotland, Ire-

land, and Wales, eight hundred furnaces, which, if worked forty weeks a year, would produce 180,000 tons. Various causes led to a decline in the manufacture, and in 1740 it was only 17,350 tons, produced by fifty-nine furnaces. Attempts to employ coal for smelting are said to have been made in 1620, but it is certain that no successful effort of this kind was made until a century and a-half later. The manufacture of iron rose, in 1788, to 70,000 tons; in 1800, to 180,000; in 1825, to 600,000; and in 1851, to 2,500,000; South Wales producing 750,000; Scotland, 775,000; South Staffordshire and Worcestershire, 600,000; and other districts, 400,000. In 1851 the exports were upwards of 1,200,000 tons, not including tin plates, hardware, cutlery, and machinery, the declared value of which was —tin plates, £1,018,951; hardware and cutlery, £2,826,132; machinery, £1,164,933; and adding to this, pig iron, bars, wrought iron, wire and castings, the whole value of the exports of iron was £10,424,139. During the last eleven years the increase has been most remarkable; the causes are traceable to the demand made by the rapid expansion of all our arts and sciences.

It has been very justly remarked, that it is impossible not to be struck with the vast and almost inexhaustible supplies of iron which we possess, and with the wonderful fact, that the extraordinary demand which railways and other requirements have produced, should have led, not to an increased price, but to the constant discovery of new and cheaper sources of supply. In this respect the iron trade illustrates most strikingly what appears to be a general law—that the natural resources of the world are invariably developed at the times when the progress of society most require them, and when that progress is already such as to enable us to avail ourselves to the greatest advantage of new discoveries. Thus with the iron manufacture; at first the stores of fuel which our forests contained, and the iron ores which cropped out at the surface of the ground, were amply sufficient for our purposes; then came the knowledge of the power of smelting with coal, and with this knowledge the steam-engine placed in our hands the vast stores of mineral fuel of our coal-fields. The modern system of railways next produced a demand for iron of an unprecedented character, and simul-

taneously with this demand occurred the introduction of the hot blast and the use of the black bands of Scotland. The more intimate connection of the old and the new world by means of transatlantic steamers, is followed by the discovery of Californian and Australian gold, giving to the commercial and civilized world at large an activity and a movement such as it has never before witnessed; causing streams of population to flow in unprecedented numbers from the older countries of Europe to comparatively new regions, and bidding fair to make the vast and magnificent countries of central America and Australia the seats of great and important empires.

And these populations—not isolated as the colonists of old, not struggling with long periods of poverty and slow growth, but springing up rapidly into flourishing communities—all take with them into their new homes the social wants and requirements of the older countries which they have left. Iron steamers will be required to continue their connection with those countries, and to carry on the extensive commerce they will originate; new lines of railroad will be necessi-

tated, not from towns to towns, but from state to state, and even from ocean to ocean. And not only in America are these mighty movements at work, but elsewhere also. In India, with its 180,000,000 of population, railroads must be laid down, the government of that country cannot be held without them ; its natural resources cannot be developed without them ; the rapidly extending requirements of our cotton manufacture will necessitate them ; and every line of railway that is laid down will lead to the demand for ever-increasing quantities of iron ; and even in our own country the sanitary measures to which such attention is now being directed, will require an extremely large and increasing supply of iron, both for an abundant supply of water to the dense populations of our manufacturing districts, and also for purposes of building, which the rapidly-increasing prosperity of our working classes will no longer permit to be overlooked, as in the past.

It is interesting in this age of iron to look back upon the Vulcan who was the father of the English iron trade, and in looking back to trace—as in justice we ought to be able to trace—wealth

and honour, which he received from a grateful country as the reward of all his toil.

This leads us at once to the story of an inventor. It is soon told; it abounds in no romantic interest; it is as plain as any common every-day life can be as to startling adventure or hair-breadth 'scape.

Once upon a time, nearly a hundred years ago, there dwelt in the town of Gosport, county of Southampton, an ingenious, enterprising man named Henry Cort. In those days iron was beginning to be an article in great demand; Watt was contriving his steam engine, Invention was rapidly extending her domain, and sending forth machines of steel and iron to do the work of flesh and bone. But nearly all the iron used in England was wrought in foreign parts; from our rich veins of ore we drew the crude material, and asked the foreigner to make it into wrought metal fit for use; for we were no charcoal burners; no forests had we to make charcoal of; iron was not to be manufactured without charcoal, so Britannia was to be content to wait upon the Swede and Russ and seek their help in the making of her crude ore into wrought metal. Now it came into the mind

of this Henry Cort—a thinking man and shrewd —that we might contrive to manufacture our own iron ; might render ourselves independent of the foreigner, a very desirable matter, as we were just then drifting into war, and might have our supplies abruptly abridged. He invented two processes ; the first of these is known as puddling, and by it wrought iron was manufactured, as it still is, by the flame of pit coal ; the second was an invention for passing the iron through grooved rollers after it had been wrought in the puddling furnace ; what had been done with difficulty and delay under the hammer, was thus done easily and rapidly by a mechanical process. Cort made these discoveries, and in making them, made Britannia mistress of herself, no longer dependent on charcoal burners and iron workers of Northern Europe.

About 20,000 tons of Orground iron, as it was called, was at that time annually imported from Sweden and paid for in money at a high price ; besides this, about 50,000 tons of bars and slabs were annually imported from Russia. Cort's process was calculated to turn all the money which had thus been annually going out

into the British pocket. But before this could be done it was necessary that the inventor should make it very clear that his invention was practicable, that it would really pay. In order to do so money must be expended ; Britannia would not help till she saw her way clear—so the inventor took out his patents and elaborated his plans at his own cost. He spent his whole life in it ; he spent his whole fortune, twenty thousand pounds and more, to elaborate his plans. The matter became the talk of the public, was duly noticed in the prints as ingenious, and so forth, was carried before Parliament, and made the subject of special investigation. Iron masters, shipwrights, and the like were called upon to give their opinion ; was this iron of the Gosport inventor really equal to the iron shipped from afar ? Was coal really capable of converting the ore into right good metal ? Let it be tested, and let the inventor wait. "To-morrow, and to-morrow, and to-morrow." The inventor every day growing poorer ; his heart sick with hope deferred ; confident of the perfection of his plan, but not at all confident of his own powers of endurance.

The result of various experiments made at

Portsmouth are given in *A Statement of Facts*, issued in 1787. From these it appears that an anchor of 67 cwt. 2 qrs. 14 lbs., manufactured from Mr. Cort's iron, and tried in the usual way, was found equal to an anchor of the like size made of Swedish Orground iron. At Deptford similar experiments were made, which resulted in showing that the purchase of an anchor made of Mr. Cort's iron was exactly the same as that of the other anchor made of Swedish iron. In the first experiment at Deptford the arm suddenly broke off near the centre before there was the slightest apparent strain, but the result of a second trial established the good quality of the iron. Experiments were made with blasts, all sufficiently successful to warrant the good opinion which had been expressed of the iron; the report finally being highly gratifying in its character. Mr. Cort's anchor was manifestly superior to the anchor made of Swedish iron; the part which broke had been injured by some accident in the heating to such a degree as to break short off with little or no strain, and the injury was visible upon inspecting the broken part, but in the second experiment with the arm which had not been so

bent, the anchor opposed to it was torn asunder in a part which had been extremely well manufactured, and where there was no appearance of imperfection, or of the iron having suffered the smallest injury. The experiments upon the hooks and strappings of bolts, and upon the hooks were also favourable to Mr. Cort's iron, which was proved to be in every respect equal, at least "in quality and substantiality," with the Swedish iron.

The result of experiments at Woolwich showed that Cort's anchor was "indubitably the strongest, and upon the whole of the trials made thereto this iron stood completely in five instances, the Swedish only in one." At Sheerness, where further experiments were made, Mr. Cort's anchor was the strongest; and of the rest of the articles, blocks, bolts, etc., two of his stood and two broke; three of the Swedish stood and one straightened. In all these experiments there was a much greater strain, as well upon those articles which were not either broken or injured as upon those which were, than is ever applied or can possibly be applied in the actual use of such instruments on board ship.

At Chatham Mr. Cort's anchor stood, the other was broken, and in eleven other experiments his iron stood four, was injured in four, and broke in three instances. The Swedish iron stood in five, was injured in five, and in one broken; so that there appeared but little inequality except in the anchor, in which the superiority of Mr. Cort's greatly overweighed the trifling inferiority of it in "the aggregate of the other articles." At Plymouth the experiments were highly successful, and the master smith of the yard expressed his opinion that this iron was equal to any which he had ever made use of. The chief advantages of the iron were its excellent quality and the cheap cost at which it might be manufactured.

The advantages of the new method were patent to all—ay, *patent* was the word—Cort had his patent, and might look for fame and wealth as his reward; only let him wait. 'Tis a god-like attribute, this patience, perhaps we are all too much in a hurry; "everything comes in time," says the proverb, "to him who can wait." "Rome was not built in a day." Patience! Spell it as the old divine spelt it, with a full point between each

letter ; but I wonder whether Patience, who sat upon a monument and smiled at grief, ever dabbed in the patent law !

"Law is law ; law is law ; law, I say, is law." So Stevens argues in his famous case of Oxley against Flatboat. "Law is like a country dance, people are led up and down in it till they are tired. It is like a book of surgery, there are so many terrible cases in it. It is like a new fashion, people are bewitched to get into it. It is also like bad weather, most people are glad when they get out of it." Get out of it ! Once in the clutch of the law, and it is not so easy to escape. Suitors must wait for the shell, while the legal appetite is satisfied with the oyster. Things in law are not so bad now-a-days as they were. We have escaped Lord Eldon's everlasting doubt. Brougham, the law reformer, opened the lock-gates and let the water flow freely that had stagnated so long ; but law is still a weariness to flesh and spirit. The poor client sits like the heroine in the *Moated Grange*, and whispers, "I'm a weary, I'm a weary."

There was the poor patentee, Cort, still waiting ; growing every day greyer and poorer.

Lord Sheffield, in his *Observations on the Commerce of the American States* remarked : “If Mr. Cort’s very ingenious and meritorious improvements in the art of making and working iron, and his invention of making bar iron from pig iron, either red sheet or cold sheet, are the great improvements on the steam engine by Messrs. Watt and Bolton, of Birmingham, and Lord Dundonald’s discovery of making coke for the furnace at half the present expense—should all succeed, as there is reason to think they will, the expense may be reduced so greatly that British iron may be afforded as cheap as foreign, even if the latter should be allowed to enter duty free, perhaps cheaper; and of as improved a quality, and in quantity equal to the demand. It is not asserting too much to say, that event would be more advantageous to Britain than thirteen colonies. It would give the complete command of the iron trade to this country, with its vast advantages to navigation; and our knowledge of the iron trade seems hitherto to have been in its infancy.”

In a letter dated May 15, 1786, Dr. Joseph Black, professor of chemistry at Edinburgh, fur-

nished the following testimonial to the excellency of Mr. Cort's iron:—"First, it does not require the expense of charcoal, but is performed with raw pit coal. Secondly, the iron is heated and wrought with flame only, instead of being mixed with the burning fuel and ashes, which is the case in the common process, and it is difficult to imagine how these extraneous matters can ever be completely disentangled from it again in the common process. Thirdly, Mr. Cort's method of forming the bars is better fitted for squeezing and forcing out the melted clay from every pore of the iron; and therefore, for giving such iron perfect solidity and close contact and cohesion of its parts, more than the common method with the hammer. Fourthly, by the experiments made here, I saw that Mr. Cort's iron was exceedingly soft and malleable when hot, and very tough when cold; and I have heard of much more decisive experiments made in England, which prove it to be possessed of very great strength and toughness. For these I refer to Mr. Cort, who, I suppose, can give evidence of them." Evidence of them, aye, that he could! But the Government was in no hurry to reward him, and amplest evidence would

not suffice to turn his iron to gold. Still, without the Government doing anything in the way of reward—which any other government would have done without hesitation—it might possibly have allowed the inventor to reap profit from his patent. He had made terms with the chief ironmasters, who, under contract, agreed to pay him ten shillings per ton for the use of his discovery. Then the Government, afraid that Cort might suddenly grow rich, stepped in and doubted—not the worth of the invention, but the right of the inventor.

Greyer and poorer, this unfortunate man had to recapitulate his claims on the public purse.

After having described the puddling process, he proceeds:—“And the whole of the above part of my method and process of preparing, manufacturing, and working of iron, is substituted instead of the use of the finery, and is my invention, and was never before used or put in practice by any other person. The iron so prepared and made may be afterwards stamped into plates, and filed, or broke, or worked in an air furnace, either by means of pots or by piling such pieces, in any of the methods ever used in the manufacture of

iron from coke fineries without pots, but the method and process invented and brought to perfection by me, is to continue the loops in the same furnace, or to put them to a white or welding heat, and then to shingle them under a forge-hammer, or by other machinery, into half blooms, slates, or other forms ; and they may be heated in the chafery according to the old practice ; but my new invention is to put them again in the same or other air furnaces, from which I take the half blooms and draw them under the forge-hammer, or otherwise, as last aforesaid, into convenient bars, half flats, small square tilted rods for wire, or such uses as may be required ; and the slate having been shingled in the foregoing part of the process to the sizes of the grooves in my rollers, through which it is intended to be passed, is now worked by me through the grooved rollers, in the manner in which I use bar or wrought iron, fagoted and heated to a welded heat for that purpose ; which manner of working any sort of iron, in a white or welded heat through grooved rollers, is entirely my own invention. Iron and also steel, so prepared, made, wrought, and manufactured by such effectual application of fire and machinery

will be discharged of the impurities and foreign matter which adheres to them when manufactured in the methods commonly practised. The steel is of an excellent quality, and the iron will be found to be good, tough iron in bars and wire, whether large or small: and all sorts of merchant iron, whether it be made from metal of a red sheet or a cold sheet nature, and blistered steel, whether made from iron prepared according to the above process or from any other iron, when fagoted together, heated to a white or welding heat, rolled in that heat through grooved rollers, according to the method invented by me, and slit through the common cutters, is equal to steel manufactured by forge and tell hammers. The whole of which discovery and attainment are produced by a more effectual application of fire and machinery, as described by me, than was before known or used by others; and are entirely new, and contrary to all received opinions amongst persons conversant with the manufacture of iron; and the whole of my method may be completed without the necessity of using finery, charcoal, coke, chafery, or hollow fire, or without requiring any blast, or the use of flues, in any part of the process."

Of Henry Cort's right to the proceeds of the process there could be no more doubt than there was as to the value of the invention. Every day its importance was more clearly exhibited ; but passive injustice was still done to the inventor, until at last active wrong, open and deliberate, took the place of the long passive injury. Cort's patents were seized by the Treasurer of the Navy, charges vague and unsupported, except by the perjury of a hanger-on of officialism, were brought against the patentee ; in defiance of all right the whole of his property embarked in a lucrative trade was seized, and he reduced to the verge of beggary.

This remarkable case was involved then, and is involved now, in much obscurity ; there had been so much secret, underhand work one way and another, that Government seemed to shrink from any rigid investigation. No account of the proceedings taken against Cort ever appeared in his lifetime ; they were hidden in the penetralia of the Navy Office ; it was not his fault that the affair was not made public. Who could make the Navy Office speak if it were resolved to be stone dumb as the lion's head at Venice ? Shortly

after Cort's death, when, after a wordy warfare of an awful length, a commission was appointed to inquire into the financial department of the navy, it appeared that, "a few weeks before the sitting of the commission, the treasurer and his deputy indemnified each other by a joint release, and agreed to burn their accounts for upwards of a million and a half of public money, which had passed (or had not passed) through their hands. With the account they burnt also papers having reference to Mr. Cort's case; having done which they refused to answer questions which might criminate themselves."

The story of the inventor is thus very plain. At a period when England most required such help, Henry Cort discovered or invented his new process of iron manufacture. By doing so he enriched the country to an extent which cannot fairly be estimated, seeing that we are still reaping the advantage in millions every year. He was the pioneer of our iron age, and the reward was ruin to himself and beggary to his children!

About ten years after the death of Henry Cort, a number of the wealthy iron masters who had grown rich on the poor man's genius, resolved in the

liberality of their souls, to do something for the widow and orphans. These good, easy men were not the sordid wretches, cold and hard as iron, as they had been represented, or if they were, they and the iron together were capable of melting and being turned to any useful purpose under the wizardry of dead Cort. They paid over forty-one guineas, subscribing "about a twentieth part of a farthing in the pound" upon the profit they had made by Cort's invention!

This affords but small encouragement to inventors; a strong inducement to an English inventor to carry his invention elsewhere.

The Government, of course, when properly aroused to the absolute necessity of doing something, did that something with a righteous regard to the interests of the tax-paying community. "Waste not want not"—wise proverb! It is well to be economical. The people look with suspicion upon all pensions, and it is well to be cautious. Everybody, field-marshals, lord chancellors, deputy-red-tape clerks, and all the host of hangers-on expect pensions, and must have them. Deny pensions to prominent people, the satellites of place and office, and every hair of the British Lion bristles

with indignation. But then the daughters of an iron-founder putting in their claims for consideration is troublesome, to say the least of it; still Government, the Government of George Frederick, Prince Regent, would not send the petitioners empty away. The munificent sum of twenty-five pounds six shilling annually was granted as a pension to Cort's daughters. A deduction was, however, made, no one knows why, and the sum actually paid was only twenty pounds, and out of this sum a clerk, who had the trouble of transmitting it, pocketed a pound as his fee. This has been mended. An increased pension has been granted—a pension on the Civil List, inadequately small, but handsome in comparison with what had been given.

In the old days of heathenism men deified an inventor—they gave him a place among the gods; now-a-days the inventor is too often beggared, and has his place among paupers!

GEORGE WILSON, THE CHEMIST; OR, THE POWER OF THE SOUL OVER THE BODY.

THE story of this man's life is one of those extraordinary instances of the power of the mind over the body, which serve so ably to illustrate the true nobility of man. Of George Wilson, the chemist, it may fairly be said, as he himself wrote of another :—

“Thou wert a daily lesson
Of courage, hope, and faith ;
We wondered at theo living,
We envy thee thy death.

“Thou wert so meek and reverent,
So resolute of will ;
So bold to bear the uttermost,
And yet so calm and still !”

George Wilson was born at Edinburgh on the 21st of February, 1818. He was one of twin brothers, rendered especially precious to their parents by the fact of previous bereavements.

The boys were happily blessed with that best of blessings, a good mother, and they loved her dearly. "The eloquence of the Gracchi derived its perfection from the mother's eloquence and purity of language, and that of Hortensius was formed in his father's breast. What young minds imbibe is scarcely ever to be rooted out, and they are disposed sooner to imitate defects and vices than virtues and good qualities. Alexander, the conqueror of the world, could never correct the faults in his gait and manners which he had learnt in his childhood from his master, Leonidas." These boys enjoyed the felicity of excellent training; it was their mother's custom to visit every night the cot of her children, and utter beside them the patriarchal benediction: "The God which led me all my life long unto this day; the Angel which redeemed me from all evil, bless the lads." This was done so often and so long that George recollects it as one of the most hallowed remembrances of his infant years, and he once said to a friend that he used to lie awake with his eyes shut, in order that he might listen for the words of his mother's blessing.

'The educational facilities afforded by the good



A MOTHER'S CUSTOM.—*Page 250.*

city of Edinburgh were employed to the advantage of George Wilson. He was diligently instructed, both at home and at school, and he availed himself of his opportunities with very great success. At seven years of age he was a bit of a poet, a bit of a wag, and a bit of a Latin scholar. Here is a sample of his rhyming skill, addressed with a long letter to his mother:—

“Now let us sing
Long live the king,
And *Bolus* long live he;
And when he next
Does say this piece,
May I be there to see.”

Bolus was his brother, so called from reciting the Dr. Bolus story with immense success at some family gathering. Books were the great attraction of young Wilson. He would sit for hours with “a book as big as himself,” a volume of the *Encyclopædia Britannica*, pondering its pictures, poring over its texts. He addicted himself in his very early youth to what some people would call heavy reading, but it was not heavy to him. It was bright and beautiful as any fairy-tale, for it told of all the wonders of creation, from a star to a stone, of birds, beasts, and fishes, of distant

countries, and of distant times, of battles, triumphs, and defeats.

For Nature he felt a marvellous admiration, and animals he loved with an intense affection, which made him, even in his more advanced life shudder at the suffering sometimes caused to them by scientific experiments. Rabbits, dogs, white mice—quite a menagerie was that of his early home ; and pleasant were the days he spent wandering in the environs of his native city, and drinking deeply at the fount of poetry—Nature.

Keble has a very pleasing theory in connection with poetry—the poetry which stirred the heart of Wilson. In his view the three great divisions of poetry belong naturally to three successive periods of the world : the epic sprung from the heroic youth of a race ; the drama with its varied scenes and rival interests from the ambitious maturity of middle age ; while as civilization advances further in the cycle of time, the human heart, oppressed with the strife of passion, the eye wearied with the restless pageant of variety, turn instinctively to more healthful sources of enjoyment, and seeking refreshment from the sweetness and beauty of the natural

world, give expression to the feelings in the poetry of human life; the verse of the field, the poetry of sunshine, birds, and flowers, has something higher and holier in it than the mere outpouring of a restless, wearied heart at rest at last. It speaks of God—God seen in His works, whose praise is declared by the heavens, and echoed by the earth, and it regards the simplest flower as blooming at the gracious will of the Almighty, fragrant with holy blessing, and dearer to the heart than when fancy dyed its petals with the blood of a fabled Adonis. Thus science and poetry, twin-stars, shone on the path of young Wilson. He says himself: “I would liken Science and Poetry in their natural interdependence to those binary stars, often different in colour, which Herschel’s telescope discovered to revolve round each other. That star or sun, for it is both, with its cold, clear white light is Science; that other with its gorgeous and ever-shifting hues and magnificent blaze is Poetry. They revolve lovingly round each other in orbits of their own, pouring forth and drinking in the rays which they exchange; and they both also move around and shine toward that centre from

which they came, even the throne of Him who is the source of all truth and the cause of all beauty."

After passing the usual term at the High School, Edinburgh, George Wilson was apprenticed (1832) in the laboratory of the Royal Infirmary. He was designed for the medical profession. He was an assiduous student, attended classes at the University for some branches, and in the extra Academical Medical School for others. He passed his examination for the College of Surgeons' degree on the 6th of September, 1837.

During his academical course, he had resided at home, a home sanctified by religion, a happy home, where even heaviest affliction seemed to come laden with odours from heaven, where even Azrael, angel of death, was regarded only as a messenger of light. That home was not exempt from sorrow and misfortune, but the inmates sorrowed not as others who have no hope; God was the strength of their hearts, and their portion for ever. Imagine an impressible and emotional man studying the physical sciences under such influences. Every new discovery, every new truth, every step in every scientific investiga-

tion, lifting his thoughts from nature up to God. Religion and science were in his mind united. He saw no opposition in them. The works of God spoke to him in harmony with the Word of God. He saw all things in God's light, and could trace no antagonism.

Geology did not give the lie to Genesis; astronomy did not deride the Psalms; there was no want of symmetry in God's temple, built up of nature and revelation, but whose portals are low, that those who enter there must go in kneeling. Said an eminent Christian philosopher—“Science has a foundation, and so has religion; let them unite their foundations, and the basis will be broader, and they will be two compartments of one great fabric, reared to the glory of God. Let the one be the outer, and the other the inner court. In the one, let all look, and admire, and adore; and in the other, let them all have faith, kneel, and pray, and praise. Let the one be the sanctuary where human learning may present its richest incense as an offering to God; and the other, the holiest of all, separated from it by a veil, now rent in twain, and in which, on a blood-sprinkled mercy-seat, we pour

out the love of a reconciled heart, and hear the oracles of the living God."

Towards the close of the year 1838, George Wilson came to London. Here he attended the laboratory of Professor Graham, and was associated in his medical studies with the famous African traveller and missionary, Dr. Livingstone. After remaining a few months in London he returned to Edinburgh, where in June, 1839, he obtained his degree of M.D. It was about this time that he sustained a severe loss by the death of a cousin, who had been brought up with him; and soon afterwards, when engaged in delivering lectures on chemistry in the Academical Medical School, he was attacked by sickness. The disease was caused by a sprain in his foot, nothing important in its beginning, but disastrous in its issue.

George Wilson, at the time we speak of, was a young man, scarcely four-and-twenty; ardent in temperament, clear-headed, brave-hearted, with gay humour, keen repartee, brilliant fancy, solid information, sound judgment, elastic in corporeal as in mental frame—a realization of the ancient desire, a sound mind in a sound body.

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By a slight sprain, neglected, this man, full of hope, entering on an honourable profession, was stricken down, invalided for life; that life only saved by submitting to amputation of the foot.

He agreed to submit to the operation, but asked a week to prepare for it, not with the slightest expectation that the disease would take a favourable turn in the interval, or that the anticipated horrors of the operation would become less appalling by reflection upon them; "But simply," he says, "because it was so probable that the operation would be followed by a fatal issue, that I wished to prepare for death and what is beyond it whilst my faculties were clear, and my emotion comparatively undisturbed; for I knew well that if the operation were speedily followed by death, I should be in a condition in the last degree unfavourable, to making preparation for a great change."

There was something noble in the man's resolve. No trembling, no hesitation as to pain or suffering, but an earnest desire to be fit to die, to be prepared if death should come to meet him with a composed spirit, to conquer death and the fear of death, by seeking life, from Him who

is the Life. Is it not written, "He that believeth in Me, though he were dead, yet shall he live : and whosoever liveth and believeth in Me shall never die." During the whole of the preparation week the New Testament was scarcely ever out of his hand. "He says, "I prayed to God for light and help, and my prayer was heard and answered."

The amputation was successfully performed ; the good man came forth from his chamber crippled for life, but alive with new energy and zeal. "That season always comes back to me," he used to say, "as a very solemn one ; yet if, like Jacob, I halt as I walk, I trust that like him, I came out of that awful wrestling with a blessing I never received before ; and you know that if I were to preach my own funeral sermon, I should prefer to all texts, 'It is better to enter halt into life, than having two feet to be cast into hell, into the fire that never shall be quenched.'"

The good humour of George Wilson, even in the most painful circumstances was very remarkable. Is it not Thomas Hood who wrote on his dying bed that he had travelled from *Grin-age* to *Dull-age*? Something in the same spirit Wilson spoke and wrote of his affliction, for his religion never banished cheerfulness from his heart or conversa-

tion. "I lie," he says, shortly after the amputation, "in such a strangely twisted position, half on my back and half on my side, that my views of all matters are quite one-sided. . . . My feelings got so much the better of me at thinking that my dancing days were over, that I had to give them outlet in the shape of an elegy, which, with the help of a little snuff in your eye, I shall expect you to weep over:—

No more shall I in country dance or reel,
Lubitsky's waltz or Musard's last quadrille,
Shuttle my feet, or let my body wheel,
On light "fantastic toe."

When I creep outwards to the light of day,
The people passing me will turn and say:
"That little fellow limping o'er the way
Has one foot in the grave."

In writing to Miss Abernethy, he says: "My diet consists chiefly of the flesh of chickens, to which I have betaken myself from a remembrance that these worthy animals spend a greater part of their lives standing on one leg; a feat which, now I am struck off the list of bipeds, I cannot learn to perform too well, and which the infusion of their substance into mine might conduce to make more easy."

But notwithstanding these pleasantries, the

intensified religion of the man's life shows conspicuously in whatever manner he was occupied. In one of the last papers which he wrote, an article on Paper, Pen, and Ink, this is very apparent, he says—

"When Paper, Pen, and Ink have made the tour of the world, and have carried everywhere the acknowledgment of brotherhood between people and people, and man and man, and the song of Bethlehem, fulfilled to the full, has enlightened every intellect and softened every heart, their great mission will be ended. And let us not complain that our writing materials are one and all so frail and perishable, for God Himself has been content to write his will on the frailest things. Even his choicest graphic media are temporal and perishable. The stars of heaven are in our eyes the emblems of eternity, and they are the letters of God's alphabet of the universe, and we have counted them everlasting. Great astronomers of old have told us that the sidereal system could not stop, but must for ever go on printing in light its cyclical records of the firmament. But in our own day, and amongst ourselves, has arisen a philosopher to show us the

result simply of physical forces working as we observe them do, that the lettered firmament of heaven will one day see all its scattered stars fall, like the ruined type-setting of a printer, into one mangled mass. Already the most distant stars, like the outermost sentinels of a flock of birds, have heard the signal of sunset and return, and have begun to gather closer together, and turn their faces homewards. Millions of years must clapse before that home is reached, and the end comes: but that end is sure. God alone is eternal, and they who through his gift are partakers of his immortality.

“It is wonderful to find a patient, mechanical philosopher, looking only to what his mathematics can deduce from the phenomena of physical science, using words which, without exaggeration, are exactly equivalent to those:—‘Thou, Lord, in the beginning hast laid the foundation of the earth, and the heavens are the works of Thy hands; they shall perish, but Thou remainest, and they all shall wax old as doth a garment, and as a vesture shalt Thou fold them up, and they shall be changed; but Thou art the same, and Thy years shall not fail.’

"If God's Paper, Pen, and Ink are thus perishable, shall we complain that ours do not endure? *It is the writer that shall be immortal, not the writing.*"

It has been said that he touched nothing that he did not adorn, and it may also be said, that every subject he handled was sanctified, every sacrifice salted with salt. He made no hesitation of introducing Bible texts, Bible illustrations, Bible references, into his most scientific lectures.

When he took up his residence at Brown Square, his lecture-room and laboratory being under the same roof, enabled him to attend to the duties connected with them, even when unable to leave the house. He held a medical class at ten, A.M., a veterinary class three times a week, at twelve; a class of some hundred young ladies at the Scottish Institution, and one of some "two hundred stout fellows" at the School of Arts. He took particular interest in lecturing to the working classes, and these lectures were usually thronged. At one of them he experienced some difficulty in getting in, and requested the crowd outside to permit him to pass; but they, looking round and seeing only a little man in a pea coat

and cap, indignantly declined. A laughing assurance, however, on his part that in that case they should have no lecture, speedily cleared a passage for him. How grateful these sons of toil were for the generous labours of the chemist, was seen in many a friendly token, which often brought tears into his eyes. Every week a bouquet of flowers was sent to him, and it refreshed the heart of the good man after the exhausting duties of the lecture-room, to look upon these beautiful tributes of affection. To recline on his sofa, even though he well knew he had driven another nail into his coffin, and to feel that he was appreciated and kindly thought of, was a source of intense pleasure to him. All his friends loved him, down to Stronach, the terrier, and "the absurd cat without a tail." His affection for dumb animals had been early evinced, and this cat and dog were his especial favourites. Speaking of the terrier, in a letter to a friend, during an absence from home, he says, "Give the dear beast a taste of cream, or something good, in reward thereof," for the terrier mourned his master's absence.

The life of George Wilson after the amputa-

tion, which reduced him from a condition of health and vigour to that of a cripple and an invalid, was one long dying. He knew he was dying, but it neither appalled nor paralysed him ; if his day was short, the sentiment uppermost in his mind was that he must work the harder. Pain must not be allowed to interfere with labour ; lassitude must not be indulged ; weakness and weariness must be overcome ; there was work to do that must be done with zeal and with speed. Lecturing, writing, instructing his classes filled up his time ; the only rest he allowed himself was that which was absolutely necessary to keep body and soul together. But in the midst of all his labours and sufferings he never lost his cheerfulness ; never failed when occasion served to fling out the ready jest, the brilliant repartee ; and was ever so hopeful, not of life here, but of life there, above, in the unapproachable light, that he carried with him a hallowing and sanctifying presence wherever he went.

One of Dr. Wilson's most important researches was into the subject of colour blindness. In 1852 and 1853 alone he carefully examined 1154 persons with reference to this point ; and he arrived

at the conclusion that one in every twenty persons has an imperfect appreciation of colour, and that the number who are colour blind in so marked a degree as to mistake red for green, and occasionally even red for black, is one in fifty. To a person with perfect vision, it is startling, as almost verging on the ludicrous, to see another apparently equally gifted, gravely sorting scarlet and emeraldworsteds as shades of one and the same colour, declaring that a stick of red sealing-wax was not to be distinguished on a grass plot; or writing a letter in brilliant red ink, thinking it rather a bright black. Yet such examples frequently occur. Dr. Wilson stated his opinion with regard to the cause of this defect, but he was not satisfied with mere theorizing on what might be utilized. He saw the important results, in the employment of railway and ship signals, which depended on an accurate appreciation of colour. Red and green, the very colours most liable to be mistaken for one another by those afflicted with colour blindness, are the very colours employed most commonly in signals. Dr. Wilson entered at great length into the consideration of this question in all its bearings, and pointed out

the necessity of signal-men being tested as to their appreciation of colour, describing minutely the course to be pursued, which would certainly lead to the detection of those deficient in this qualification; and as an additional measure of precaution, he dwelt on the necessity of employing the elements of form and number, as well as colour, in railway signals. Although these suggestions have not been universally adopted, they have not been entirely overlooked, and we may yet expect—when railway boards grow wiser, or Parliament looks sharper after them—a more general adoption of the doctor's plans. It is a curious fact that, in a board connected with the Admiralty, whose duty it was to look after coloured signal lights, two were colour blind, and one, a day clerk, unconscious of his defect, copied a letter in red ink, thinking it was black.

Throughout the useful and constant labours of his life, trouble came heavily on this good brave man—deep called unto deep at the noise of the waterspouts :—

"Yes, billow after billow—see, they come!
Faster and rougher, as yon little boat
Nears evermore the haven."

There was his father's sudden death ; then the death of his brother James ; then the long weary illness of his sister Mary. She was most tenderly beloved of him, and in her long seclusion from the outer world, consequent on a heart disease, it had been her delight to enter into all his literary pursuits, and to act as his amanuensis. In a letter announcing her death to a friend, he writes : " To think that yesterday was the last day I was to spend with her on this earth, and I did not know it. A round of necessary but trifling duties kept me from her. Yet I loved Mary better than I loved anything else in this world. For the last six years we had been greatly together. We knew each other so well, and she was so fond, so kind, so self-denying, so generous, so noble in all respects, so devoted, that now she has followed James I feel alone. Nobody can ever be to me what she was. I cannot estimate my obligations to her. I have leaned so long on her that, now her support is gone, I feel as lame in spirit as I am in body."

Religion sustained him. " I will not be long in joining her," he wrote ; and to those who, like him, have seen one after another pass away from

the dear home on earth to the home in heaven, how much joy there is in thought of the blest reunion above—one family in heaven and earth! After his sister's death, Wilson devoted himself even more assiduously to labour than he had done before, and especially to works of Christian usefulness. He was a warm-hearted believer, liberal in his views, not illiberally liberal, as some are, but willing to let all men adjust their creed in the light of God's love. Of the Athanasian creed he wrote—

"O Athanasius! thy too subtle creed
Makes my heart tremble when I hear it read ;
And my flesh quivers when the priest proclaims
God's doom on every unbeliever's head.

"Yet I do honour thee, for those brave words,
Against the heretic so boldly hurled—
'Though no one else believe, I'll hold my faith,
I, Athanasius, against the world !'"

But his religion, like his science, was all practical. What was the use of Christianity, he wanted to know, if it did not make the life better? He started a Medical Missionary Society; he taught a Sabbath class; he visited the sick; he did all things so kindly, so gently, that he was everywhere well received, where others, had they dared to

broach the subject of religion, would have been ridiculed or shunned. And yet he could afford to be witty about it. During a holiday in the country, he writes:—"They speak of the luxury of doing good, but what is that to the luxury of doing nothing!" Nothing! this man doing nothing! Why, his very presence did good, and yet every breath he drew was a labour. What pathetic interest attaches to the short letter to his mother, a wretched scrawl, written with his left hand, and bearing evidence of sharpest agony:—"Dear mother,—I keep better; no pain, no fever. Yours, George." The only deception he ever practised was that of concealing from those whose affections were bound up in him his knowledge of the state of his health. He knew he was dying; but why should that fact darken the earth with a cloud and banish the smile or hush the merry voice? There are far worse things in the world than dying! The humorous way in which his sufferings were described was thoroughly characteristic of the man. In allusion to what he had suffered at the hands of surgeons, he sometimes spoke of himself as "copiously illustrated with cuts." He describes his condition when suffering from severe cough, as

being attacked by a rogue, whose surname is Bronchitis ; "he comes of an old family, and cheats people into the notion that cough is a simple word, which will get simpler by use, as at last it does by changing its spelling, and ending in coffin !" And yet he had his seasons of desponding, when his roving fancy was "digging dungeons in the nether depths." Many a time he might have said with Paracelsus—

"I doubt my body
Will hardly serve me through."

But it bore up bravely. Cast down many a time, but not destroyed ; his mind triumphing over physical weakness and bodily suffering—a splendid jewel in a shattered casket.

Honours came upon him ; friends were round him ; he was esteemed and beloved ; making no foes ; winning all hearts ; but dying as he worked. He was made Professor of Technology ; he lectured to admiring thousands ; his ever-active pen struck off things grave and gay till the end came ; the end so long anticipated. A struggle to subdue every expression of language or gesture which might give distress to others characterized him to the last—when he closed his eyes—till the resur-

rection, and the pent-up agony of those who surrounded his bed broke forth uncontrolled.

"Wrong not the dead with tears!
Think not the spirit fears
To cast away its earthly bonds of clay,
To rise from death to everlasting day!
Wrong not the dead with tears!
A glowing, bright to-morrow
Endeth a weary life of pain and sorrow."

Every honour that affection and respect could offer was freely given. Professor Balfour met the class that day, according to arrangement; but not to talk of "gum and starch," but that beloved teacher who had gone home. A profound melancholy was felt all over the city; an old and faithful servant never recovered the shock; and few were able to forget the joy with which one lady said, on hearing of the Professor's death, "How glad I am!"—it meant so much!

At the next meeting of the Philosophical Society, the Vice-President alluded with tenderness to the loss which had been sustained. "We can all remember," he said, "alas! it is now only in memory that we can recall the pleasure—how often he has charmed as well as instructed us here; how often, in his prelections from this desk,

the clear, scientific exposition has been enlivened and adorned by his graceful play of fancy. . . . At the risk of intruding within the domain sacred to private friendship, I would venture to say that a gentler, nobler, more true-hearted man we have not left among us."

THE END.

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